# environmental impact statement

# EAST FRANKLIN WATERSHED

## Franklin Parish, Louisiana

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ALEXANDRIA, LOUISIANA

USDA-SCS-EIS-WS-(ADM)-75-2-(F)-LA

# East Franklin Watershed
# Catahoula, Franklin, and Richland Parishes, Louisiana

## FINAL ENVIRONMENTAL IMPACT STATEMENT

Alton Mangum, State Conservationist
Soil Conservation Service



Sponsoring Local Organization

Northeast Soil and Water Conservation District
Post Office Box 272
Winnsboro, Louisiana 71295

Franklin Parish Police Jury
Parish Courthouse
Winnsboro, Louisiana 71295

Franklin Parish Watershed Commission
Wisner, Louisiana 71378

Catahoula Soil and Water Conservation District
Harrisonburg, Louisiana 71340

Catahoula Parish Police Jury
Harrisonburg, Louisiana 71340

April 1975

PREPARED BY
UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
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EAST FRANKLIN WATERSHED PROJECT

Franklin, Catahoula, and Richland Parishes, Louisiana

Prepared in Accordance with
Sec. 102(2)(C) of P.L. 91-190

Summary Sheet

I. Final

II. Soil Conservation Service

III. Administrative

IV. Description of Project Purpose and Action: This project is for watershed protection, flood prevention, and drainage in Franklin, Catahoula, and Richland Parishes, Louisiana, to be implemented under the authority of the Watershed Protection and Flood Prevention Act (Public Law 566, 83d Congress, 68 Stat. 666), as amended. Approximately 186 miles of channel work with appurtenant measures, construction of 28 structures for water control, and measures to minimize adverse effects to fish and wildlife will be installed. Loss of bottom land hardwoods will be partially mitigated. The channel work will involve clearing and debris removal on 15 miles of existing channels, 6 miles of new channel construction, and 165 miles of enlargement by excavation to provide improved water management in a flatland watershed that is 74 percent agricultural cropland and grassland. Of the 186 miles of work proposed on existing streams or channels, 166 miles will involve those with only ephemeral flow, 17 miles with intermittent flow, and 3 miles with ponded water.

V. Environmental Impact and Adverse Environmental Effects: Floodwater and drainage problems will be reduced resulting in higher quality of crops, higher yields, and lowering of some items of production costs. Average annual agricultural floodwater damages will be reduced 81 percent. Flood damages to 100 miles of roads will be reduced. Net farm income will increase. A total of approximately 76,200 acres of cropland and pastureland will benefit from the combined program of land treatment and structural measures. About 820 farmers, 2,900 farm family members, and the employees of these farmers will benefit from the project. The average annual gross sales of farm products will increase about 17 percent. Forest management practices will increase wildlife carrying capacity.

to existing forest lands. Installation of the project together with land treatment measures, and operation and maintenance will create 379 man-years of labor. Sediment, as a result of sheet erosion, will be reduced from 867,000 tons per year to 776,000 tons per year. Installation of 28 structures for water control will create 147 acres of permanent water for fish habitat and wildlife water. Clearing of forest land for channel rights-of-way will reduce forest game habitat. Open land wildlife species will benefit by this conversion. Construction erosion will generate 15,000 tons of sediment during the projected 3-year construction period. Turbidity in the outlets will increase "locally" during construction. Water temperatures in ponded water channels will increase slightly and the biological productivity of 3 miles of ponded water will be lowered. Occasional periods of aquatic weed growth may occur in the permanent water created by the 28 structures for water control (weirs). Peak stages on portions of Bayou Macon, Tensas River, Roaring Bayou, and watershed channels will be increased by amounts ranging from infinitesimal to an estimated 0.2 foot during some floods. A reduction in air quality will occur during construction.

VI. Alternatives Considered:

A. Land treatment only

B. Floodproofing and land treatment

C. Change land use to enterprises that will tolerate wet soil conditions

D. Channel work, land treatment, and alternative locations of channel work

E. Levees and floodgates to protect against backwater flooding from Tensas River

F. No project action

VII. Comments have been received from the following agencies:

Louisiana Forestry Commission
Department of Transportation, Federal Highway Administration
Louisiana Commission on Intergovernmental Relations
Environmental Protection Agency
Advisory Council on Historic Preservation
Louisiana Department of Highways
Department of Health, Education, and Welfare
Department of Art, Historical, and Cultural Preservation
U.S. Department of the Interior, Geological Survey
Louisiana Geological Survey
Governor's Council on Environmental Quality
Department of Transportation, U.S. Coast Guard
Louisiana Wild Life and Fisheries Commission
Department of the Army
U.S. Department of the Interior

VIII. Draft Statement transmitted to CEQ on December 13, 1974.

USDA SOIL CONSERVATION SERVICE

# FINAL ENVIRONMENTAL IMPACT STATEMENT

for

East Franklin Watershed

Franklin, Catahoula, and Richland Parishes, Louisiana

Installation of this project constitutes an administrative action. Federal assistance will be provided under authority of Public Law 83-566, 83d Congress, 68 Stat. 666, as amended.

## SPONSORING LOCAL ORGANIZATION

Northeast Soil and Water Conservation District
Franklin Parish Police Jury
Franklin Parish Water Commission
Catahoula Soil and Water Conservation District
Catahoula Parish Police Jury

## PROJECT PURPOSES AND GOALS

The project goals are:

1. Provide improved farming conditions to increase farm family incomes and improve living conditions.

2. Reduce average soil loss on cropland to the minimum consistent with sound conservation farming methods.

3. Provide agricultural land a level of flood protection and drainage which will assure economic returns to farms.

4. Facilitate achieving the preceding goals by providing acceleration of the current land treatment program so that about 54 percent of the agricultural land will be adequately treated by the end of the project installation period.

5. Install project measures in a manner which will be least damaging to fish and wildlife habitat.

The purposes of the project are watershed protection, flood prevention, and drainage.

# PLANNED PROJECT 1/

## Land Treatment Measures

Land treatment measures will be installed in accordance with soil and water conservation plans developed by the land users and the Northeast and the Catahoula Soil and Water Conservation Districts. These plans are based on the proper use of soils within their capabilities. To establish capabilities and limitations, soils are analyzed and classified by the use of soil surveys.

Soil scientists with the Soil Conservation Service prepare soil maps based on systematic borings. Soils are classified according to texture, structure, color, thickness of each distinct layer, and steepness of slope. The amount of erosion which has taken place and the rate water will move through the soil are estimated. Reaction is checked to determine the pH of the soil. The land capability class (see page 21) for each soil is determined. Conservation measures to treat the land adequately will be based on these capability classes. Detailed soil surveys will be made on 177,500 acres of land.

Land treatment measures necessary to adequately treat 92,100 acres of cropland, pastureland, and other land will be installed during the installation period. The remainder of the land in the watershed will have a complete land treatment program underway. Some of the major soil and water conservation measures to be installed and their functions are as follows:

| Land Treatment Measures | Function |
|---|---|
| Conservation Cropping System | Growing crops in a sequence that will provide adequate cover to protect the soil from rainfall. Cropping system sequences vary according to needs of each field for protective soil cover. Cover and green manure are included as needed for soil protection and improvement. |
| Contour Farming | Cultivating sloping land so that plowing, preparing, planting, and cultivating is done on the contour, to reduce erosion and aid in water control. |

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1/ All information and data, except as otherwise noted by reference to source, were collected or compiled during watershed planning investigation by the Soil Conservation Service and Forest Service, U.S. Department of Agriculture.

PLANNED PROJECT

| Land Treatment Measures | Function |
|---|---|
| Crop Residue Management | Leaving crop residues on the soil surface of cultivated fields to provide soil cover during periods when erosion is critical. Crop residues are used as a mulch to intercept the impact of falling raindrops, therefore keeping soil detachment at a minimum. The tilth of the soil is increased and the water intake of the soil is increased. |
| Drainage Land Grading | Reshaping the surface of the land to be drained by grading to planned grades in order to improve surface drainage, provide more effective use of rainfall, and improve equipment operation and efficiency. |
| Drainage Mains and Laterals | Constructing open drainage ditches to designed size and grade to remove excess surface and subsurface water to improve the plant growing environment. |
| Pasture and Hayland Management | Using fertilization, weed control, and grazing practices to maintain a good, thick cover of grasses on the soil surface and produce high forage and livestock yields. |
| Pasture and Hayland Planting | Planting grasses and legumes to establish pasture or hayland to control erosion. After grasses are established, pasture and hayland management practices are used to maintain good grass cover. |
| Structures for Water Control (pipe drops) | Using structures where the force of flowing water is sufficient to cause erosion. These structures provide means of lowering the water from a higher elevation to a lower one in a short distance without causing erosion damage. |
| Forest Land Management | Proper using and protecting of forest land to provide increased realization of wildlife, recreation, timber, and watershed benefits through multiple use. |

PLANNED PROJECT

| Land Treatment Measures | Function |
|---|---|
| Improved Cutting Practices | Harvesting and treating of forest stands to minimize disturbance, encourage growth of a new stand, and improve species composition. |
| Wildlife Wetland Habitat Management | Managing wildlife wetland habitat to provide food and cover for wildlife and to maintain soil cover. |
| Wildlife Upland Habitat Management | Managing wildlife upland habitat to provide food and cover for wildlife and at the same time provide soil cover. |

Adequately treated land is land used within its capabilities, where the conservation practices that are essential to its protection and "planned" improvements have been applied. Providing necessary drainage and maintaining proper ground cover are the major problems in adequately treating land in the watershed. These measures are necessary to remove surface water at a rate adequate for healthy plant growth and to minimize erosion.

The assurance of optimum growth conditions will permit planting of recommended vegetation for ground cover and the subsequent production of maximum residue. On-farm mains and laterals, with project-type outlets, are necessary to provide drainage and flood protection needed to grow the basic agricultural crops economically.

Most cropland and pastureland have inadequate drainage systems. Adequate systems are necessary to provide the appropriate plant environment. Structural measures will decrease erosion and sediment yield and provide the opportunity to realize the benefits derived from the project. The Soil Conservation Service will be guided by the USDA policy of not encouraging the conversion of noncropland to cropland. The soil and water conservation districts will not encourage such conversions. Technical assistance as provided by the Soil Conservation Service will not be utilized to assist landowners in making such conversions.

Even though landowners are not obligated to install land treatment measures, past experiences have shown that these measures do materialize. Five watershed projects in the Louisiana delta have a land treatment program which has been underway for several years. Planned land treatment measures installed in two of the projects areas ranged from 80 to 100 percent complete and in three other projects from 27 to 75 percent complete. However these latter three projects are still in the operations stage. The Agricultural Stabilization and Conservation Service administer programs that provide financial inducement for installing land treatment measures previously discussed.

PLANNED PROJECT

Of the 92,100 acres to be treated adequately during the installation period, 72,400 acres are cropland, 16,600 acres are pastureland, and 3,100 acres are other land. In addition, conservation plans will have been prepared and some land treatment (not enough for the land to be adequately treated) begun on 36,600 acres of cropland and about 7,800 acres of pastureland.

Conservation measures to be planned and applied on cropland include conservation cropping systems, crop residue management, contour farming, drainage land grading, drainage mains and laterals, and other practices necessary to treat the land adequately. The control of headcutting and channel bank erosion where concentrations of water enter deeper channels will be accomplished through the installation of structures for water control (pipe drops). See Figure 2 of appendix F.

Conservation measures to be planned and applied on pasture include pasture and hayland planting, pasture and hayland management, drainage mains and laterals, and other measures as needed to adequately treat the land. These measures will contribute materially to the establishment of a sound livestock grazing program.

Approximately 800 acres of multiple-use wildlife habitat on cropland and 1,600 acres on other land will be maintained, created, and improved during the installation of land treatment measures by establishing plants for wildlife food or cover. Technical assistance through the soil and water conservation districts program will be made available to landowners and operators to encourage and assist them in the proper development of measures that will improve wildlife habitat and harvest. Technical assistance will be given in the establishment and management of farm ponds. These measures will be accomplished on private land. Access to these features would be left to the discretion of the landowner.

Forest land will continue to receive fire protection under the Cooperative Forest Fire Control Program. Land treatment measures will be applied on 1,200 acres of forest land. These measures will contribute to watershed protection by reducing storm runoff and sediment production from susceptible upland soils, and will enhance the future economy of the watershed.

Management plans will also be developed on 8,600 acres of forest land. These plans will be directed toward resources management for forest products, wildlife habitat, and watershed protection. A forester will be assigned to the project to guide and assist landowners in installing the planned forestry measures.

The land treatment measures will be installed during the 10-year installation period. Installation and maintenance of needed land treatment measures will continue after project installation.

Accelerating the present rate of technical assistance will make possible the accomplishments during the 10-year installation period as listed on page 9.

1. Approximately 350 land users will become soil and water conservation district cooperators and develop conservation plans for their land.

2. Soil and water conservation plans will be developed on 82 group enterprises by two or more land users on two or more operating units.

3. Revisions will be made to 100 soil and water conservation plans to bring them up-to-date in light of new technology.

4. Soil surveys will be made on 177,500 acres of the remaining land in the watershed.

5. Complete land treatment programs will be installed on 92,100 acres of cropland and pastureland and treatment begun on an additional 44,400 acres.

## Structural Measures

Measures in this plan are comprehensive in nature, with full consideration given to the multiple-use concept of resource planning. The primary benefits that will accrue as a result of project installation to fish and wildlife while achieving these objectives is an important concern. Installation of structural measures will be completed during a 5-year period.

Approximately 222 miles of channels are necessary to achieve project objectives in reducing flood damages and inadequate drainage. Investigations indicate 36 miles are adequate and will not require work, 15 miles will be cleared leaving the ground cover and root armor, and 171 miles will be enlarged. The length and area to be cleared on each channel are shown on the tabulation on the following page. (See the coding system on page H-9 for explanation of the type of channels, type of work, and flow conditions.)

Classification of the type of channel and flow characteristics of the project channels are as follows:

| Type of Channel | Length Project Channels | Length Requiring Work |
|---|---|---|
| | miles | miles |
| Manmade or previously modified | 169 | 144 |
| Natural or previously modified | 47 | 36 |
| Nonexisting or no defined channel | 6 | 6 |
| Total | 222 | 186 |
| Flow Characteristics | | |
| Ephemeral | 193 | 166 |
| Intermittent | 22 | 17 |
| Ponded Water | 7 | 3 |
| Total | 222 | 186 |

LENGTH AND AREA OCCUPIED BY CHANNELS

| Channel Number | Excavation | | | Clear Only | | | Adequate | | |
|---|---|---|---|---|---|---|---|---|---|
| | Length | Right-of-Way Existing | Right-of-Way Planned | Length | Right-of-Way Existing | Right-of-Way Planned | Length | Right-of-Way Existing | Right-of-Way Planned |
| | miles | acres | acres | miles | acres | acres | miles | acres | acres |
| M-1 | 16.4 | 166 | 236 | 3.7 | 43 | 43 | 1.4 | 28 | 90 |
| L-1A | 2.2 | 5 | 15 | | | | 1.5 | 4 | 4 |
| L-1B | 1.5 | 4 | 11 | | | | | | |
| L-1C | 0.6 | 1 | 5 | 1.2 | 6 | 7 | 1.5 | 5 | 5 |
| L-1C-1 | 3.1 | 8 | 26 | | | | 0.7 | 3 | 3 |
| L-1C-1A | 0.5 | 1 | 3 | 0.3 | 2 | 3 | | | |
| L-1E | 1.2 | 2 | 10 | | | | | | |
| L-1F | 0.1 | 6 | 7 | | | | 2.2 | 18 | 18 |
| L-1F-1 | 1.4 | 2 | 9 | | | | 0.4 | 1 | 1 |
| L-1F-2 | 1.9 | 10 | 14 | | | | | | |
| M-2 | 3.6 | 28 | 34 | 2.1 | 16 | 19 | 4.5 | 20 | 30 |
| L-2A | 2.1 | 5 | 15 | | | | 1.9 | 6 | 6 |
| L-2A-1 | 1.5 | 3 | 11 | | | | 0.1 | 1 | 1 |
| L-2B | 3.0 | 5 | 21 | | | | 1.2 | 6 | 8 |
| L-2B-1 | 0.5 | 1 | 4 | | | | | | |
| L-2C | 3.1 | 11 | 31 | | | | 2.0 | 11 | 15 |
| L-2C-1 | 1.6 | 4 | 11 | | | | | | |
| L-2C-2 | 0.2 | 1 | 2 | | | | | | |
| L-2C-2 Alt. | 1.2 | 3 | 8 | | | | | | |
| L-2D | 2.3 | 10 | 20 | | | | 0.2 | 1 | 1 |
| L-2D-1 | 0.6 | 1 | 4 | | | | | | |
| L-2E | 0.6 | 1 | 4 | | | | 0.1 | 0 | 0 |
| L-2F | 0.6 | 1 | 4 | | | | | | |
| L-2G | 1.3 | 4 | 10 | | | | 0.2 | 1 | 1 |
| L-2H | 1.7 | 3 | 11 | | | | | | |
| M-3 | 16.4 | 137 | 253 | 2.5 | 17 | 18 | 2.5 | 15 | 50 |
| L-3A | 1.7 | 13 | 16 | | | | | | |
| L-3A-1 | 0.3 | 1 | 2 | | | | | | |
| L-3B | 3.7 | 38 | 53 | | | | | | |
| L-3B-1 | 1.5 | 5 | 12 | | | | | | |
| L-3B-1A | 0.6 | 1 | 4 | | | | | | |
| L-3B-2 | 3.0 | 8 | 30 | 0.3 | 1 | 2 | | | |
| L-3B-2A | 1.0 | 4 | 7 | | | | | | |
| L-3B-2B | 1.9 | 10 | 16 | | | | | | |
| L-3B-2B-1 | 0.7 | 4 | 6 | | | | | | |
| L-3B-3 | 2.4 | 6 | 17 | | | | | | |
| L-3C | 0.7 | 2 | 6 | | | | | | |
| L-3D | 6.0 | 45 | 57 | | | | | | |
| L-3D-1 | 2.0 | 12 | 18 | | | | | | |
| L-3E | 5.4 | 26 | 44 | | | | | | |
| L-3E-1 | 1.0 | 2 | 7 | | | | | | |
| L-3F | 4.9 | 14 | 43 | | | | | | |
| L-3F-1 | 1.9 | 10 | 14 | | | | | | |
| L-3G | 2.5 | 13 | 24 | | | | | | |
| L-3G-1 | 2.1 | 14 | 16 | | | | | | |
| L-3G-1A | 1.0 | 4 | 7 | | | | | | |
| L-3G-2 | 0.8 | 2 | 6 | | | | | | |
| L-3H | 5.4 | 33 | 49 | | | | | | |
| L-3H-1 | 0.4 | 2 | 3 | | | | | | |
| L-3H-2 | 1.9 | 8 | 17 | | | | | | |
| L-3H-3 | 2.7 | 6 | 20 | | | | | | |
| M-4 | 1.0 | 2 | 7 | | | | 2.8 | 4 | 4 |
| L-4A | 0.7 | 1 | 5 | | | | 1.4 | 13 | 17 |
| M-6 | 0.6 | 2 | 5 | | | | | | |
| M-7 | 2.1 | 6 | 18 | | | | | | |
| L-7A | 0.4 | 0 | 3 | | | | | | |
| M-8 | 2.5 | 9 | 19 | | | | | | |
| M-9 | 3.2 | 16 | 43 | 0.8 | 5 | 6 | 5.2 | 35 | 64 |
| M-9A | 4.4 | 23 | 45 | | | | | | |
| M-10 | 2.0 | 3 | 15 | | | | | | |
| M-11 | 0.9 | 5 | 10 | | | | | | |
| M-12 | 1.6 | 3 | 13 | | | | 2.9 | 21 | 25 |
| L-12A | 2.0 | 10 | 20 | | | | | | |
| M-13 | 0.8 | 5 | 6 | | | | | | |
| M-14 | 3.5 | 1 | 34 | | | | 0.3 | 8 | 10 |
| L-14A | 1.9 | 5 | 14 | | | | | | |
| L-14B | 0.9 | 0 | 7 | | | | | | |
| M-16 | 3.7 | 11 | 29 | | | | | | |
| M-17 | 4.2 | 13 | 43 | | | | 1.0 | 11 | 16 |
| M-18 | 2.2 | 11 | 22 | | | | | | |
| L-18A | 0.8 | 2 | 6 | | | | | | |
| M-20 | 2.3 | 16 | 40 | 1.5 | 13 | 13 | | | |
| M-21 | | | | 2.6 | 25 | 25 | 2.0 | 23 | 47 |
| M-21A | 2.7 | 20 | 36 | | | | | | |
| M-22 | 1.9 | 6 | 14 | | | | | | |
| Total | 171.0 | 876 | 1,727 | 15.0 | 128 | 136 | 36.0 | 235 | 416 |

These flow conditions will remain the same after the project is installed, except for the increase in ponded water created by the installation of structures for water control (weirs).

Twenty-eight structures for water control (weirs), shown in Figure 3 of appendix F, will be installed at strategic points in channels to reduce possible adverse effects to fish and wildlife habitat, reduce downstream sediment following construction, reduce growth of vegetation on the channel bottom during dry season, and maintain aesthetics of the landscape. These structures will be installed prior to any work being performed on the upstream end of involved channels and laterals. They will create approximately 46 miles (147 surface acres) of permanent water.

A permanent fixed structure for water control (weirs) will be placed at the upper end of Channel M-20 (outlet end of Wiley's Brake) to insure a permanent water level in Wiley's Brake. The Soil Conservation Service with assistance from the Louisiana Wild Life and Fisheries Commission and the U.S. Fish and Wildlife Service will determine the final fixed elevation of the weir during the operations stage of the project.

Two grade stabilization structures that will be installed (Figure 4 of appendix F) are considered integral parts of project channels. They will prevent headward and lateral channel erosion and will protect the channels and main outlets from excessive sedimentation, thereby reducing downstream turbidity and maintenance. The exact locations of these structures will be determined during the operations stage when additional survey data and foundation investigations are made.

Figure 2 of appendix F shows a typical structure for water control (pipe drop) to be installed to prevent erosion where side water enters and thus protect the channel from excessive sedimentation. Its function will reduce maintenance cost and insure proper functioning of the channels. These structures are similar to grade stabilization structures except that they are smaller, less complex, and are located on small laterals entering project channels. They are considered appurtenant measures to channel work.

Spoil from channels in forested areas will be stacked and shaped; spoil from channels in open areas will be spread. New sections of channels will be constructed for better alignment of existing channels or to create more effective use of existing land patterns and drainage systems. However, existing channels alignment will be given priority in order to preserve the environment and preserve aesthetics of the landscape.

Where the main channel joins a lateral of near equal depth, short sections of the main channel downstream from the junction will be deepened to intercept sediment. Short recesses for sediment interception will be installed in laterals where the main channel is considerably deeper.

As the channel work is being done, berms will be maintained and spoil will be placed in a manner to allow operation and maintenance equipment access to the channel. Where necessary, culverts will be placed in ditches entering project channels to allow continuity of access. Structures for water control (pipe drops) will be constructed to permit vehicular crossings. Figure 1 of appendix F shows a typical profile and cross section of a channel.

Field reviews were made by biologists of the Louisiana Wild Life and Fisheries Commission, the U.S. Fish and Wildlife Service, and the Soil Conservation Service. Many of the suggestions from these reviews were incorporated into the plan. Certain reaches of channels, or in some cases entire channels, were eliminated where excavation or clearing would disturb valuable fish or wildlife habitat. Channel work was eliminated on lower ends of channels entering major streams or lakes so that the undisturbed areas will have a filtering effect on runoff. Specific locations of some of the structures for water control (weirs) were determined so that they would more effectively reduce adverse downstream effects and benefit streamside wildlife.

Where the lower ends of channels entering Boeuf River, Tensas River, and Bayou Macon proved adequate, work was eliminated as far upstream as possible. Channels M-1, M-2, M-3, M-4, M-4A, M-9, M-12, M-17, M-20, and M-21 are surveyed channels where this determination has already been made. These adequate sections are shown on the Project Map, Appendix C. Quantities were estimated on Channels M-6, M-7, M-8, M-10, M-11, M-13, M-16, and M-22, and adequacy checks will be made prior to construction.

Project channels will occupy 2,279 acres of rights-of-way of which 416 acres are in adequate channels and 1,863 acres will be disturbed by channel work. Approximately 823 acres to be disturbed are occupied by existing channels, berms, and spoil. Therefore, approximately 1,040 acres of additional area will be needed to install project measures. This 1,040-acre increase comprises about 393 acres of open land, 383 acres of wooded channel banks, and 264 acres of forest. The 393-acre increase in requirement of open land is for spoil deposition during channel excavation and this acreage is included in rights-of-way computations. However, when the spoil is spread, 379 acres will revert to cropland resulting in a net loss of 14 acres.

Several alternatives for establishing vegetative cover on the disturbed areas in forest land were evaluated by the Louisiana Wild Life and Fisheries Commission, U.S. Fish and Wildlife Service, and Soil Conservation Service. All of the disturbed areas will be seeded with grasses. In addition, spoil in the forest land will be planted with hardwood seedlings selected from the following species--water oak, willow oak, sweet pecan, and nuttall oak.

Excavation will be done from only one side of the channel to preserve valuable wildlife habitat. Also, leaving the forest vegetation undisturbed on one side will provide shade needed during summer months for the fisheries in ponded water channels.

Efforts will be made to maintain trees and woody growth along channels for aesthetic purposes. There are 39 miles of channel to be worked through forest land and 80 miles through areas where woody vegetation exists along the banks adjacent to cultivated land. Trees inside the channel rights-of-way may be aesthetically pleasing as individuals because of their large size, form, color, leaf texture, bark, or because of their flowering or fruiting characteristics. As many of these trees as possible will be left, considering requirements for construction, operation, and maintenance. (Refer to Figures 5 and 6 of appendix F.)

Vegetation will be established on rights-of-way and disturbed areas along project channels after heavy or plant-destroying equipment has ceased travel on the berm. Depending on the season of the year, the crops being grown, and desires of the farmer, the spoil may or may not be spread on open land soon after construction. Spoil in forest land will be shaped and seeded. Depending upon soil type and season of the year, vegetative species such as the following can be used - Common bermudagrass, Pensacola bahiagrass, Sericea lespedeza, Browntop millet, ryegrass, and fescue. Hardwood seedlings will be planted after a ground cover is established. A time lapse of about 25 years will have to occur to restore the disturbed areas in forest land to their present vegetative composition and size.

Alteration, modification, or reconstruction of some existing facilities such as bridges, culverts, and pipelines will be necessary to insure proper functioning of planned structural measures. The work on the bridges involves the enlargement of the channel cross section by excavating under the bridge, reinforcing one or more bents of pilings, or lengthening a bridge in order to widen the channel. Work on the culverts involves replacing existing culverts with larger ones, lengthening existing culverts, or lowering the grade of existing culverts. Work on the pipelines involves the lowering or casing of existing pipelines. No bridges, culverts, or pipelines will be relocated.

This alteration, modification, or reconstruction includes, but is not limited to, 4 bridges and 25 culverts on State and Federal highways, 80 bridges and 70 culverts on parish and private roads, and pipelines at 30 locations. The work will be done concurrently with channel construction. The specific location of existing facilities to be altered are shown on the design profiles and cross sections in the working files. Replacement of any State and Federal highway bridges or culverts will be coordinated with the Louisiana Highway Department early in the design phase prior to construction. Designs will be in accordance with current standards for traffic and type of highway.

There are no relocations of residences or businesses required.

All clearing wastes and construction debris will be buried, burned, or removed from the construction site. Burning, if necessary, shall be conducted in accordance with the Louisiana Air Control Commission regulations and other applicable laws governing such operations. Noise levels will be monitored, and standards set by the Occupational Safety and Health Act will be followed.

The locations of archaeological sites along specified channels of the East Franklin Watershed were obtained by an archaeological survey along the margins of the channels. The survey was conducted by

archaeologists of the Geosciences Department and Research Institute of Northeast Louisiana University.

None of the 34 archaeological sites located along or near the specified channels will be affected by proposed works. However, a careful watch for buried cultural remains will be maintained. If artifacts or other items of prehistoric or historic archaeological interest are uncovered during construction, the archaeologists at Northeast Louisiana University, the Curator of Anthropology, the Historical Preservation Officer, and the National Park Service will be notified and given an opportunity to evaluate and make recommendations for salvage or mitigation before construction continues. The Advisory Council on Historic Preservation will be afforded an opportunity to comment if such sites are determined to be eligible for inclusion in the National Register of Historic Places in accordance with the "Procedures for the Protection of Historic and Cultural Properties."

The State Historic Preservation Officer's letter dated January 9, 1975 states that his department does not know of any sites on the National Register of Historic Places or being actively nominated to the National Register which would be affected by this proposed project.

Twenty-eight structures for water control (weirs) shown as Figure 3 of appendix F will be installed in channels to minimize damages to fish and wildlife resources caused by construction. The structures will create 147 acres (46 miles) of permanent water. Installation of the weirs will minimize damages caused by modification of 17 miles of intermittent flow channels and 3 miles of ponded water channels.

The game fish population in Bayou Macon "cutoff No. 3" could be reduced 44 percent if the turbidity caused by construction is not offset by the installation of land treatment measures and the measures to reduce construction-induced erosion. Should a significant reduction or species composition change occur, the loss will be restored by renovating and restocking the cutoff after turbidity levels have recovered to an acceptable level. The U.S. Department of the Interior, Fish and Wildlife Service will furnish the fish for restocking. The data on page 15 summarizes the preproject and postproject conditions for fisheries that are affected by construction.

Two hundred seventy-seven acres of forest land habitat will be cleared for channel rights-of-way. This acreage includes the clearing for the berm, spoil, and channel enlargement. The existing acreage in channels was not included in this total because the channel proper contains only small diameter, woody vegetation or no woody vegetation at all.

| Preproject Name | Flow Condition | Acres | Standing Crop | Total Pounds |
|---|---|---|---|---|
| Channels | Intermittent | 59 | 20 lbs/ac | 1,180 |
| Channels | Ponded | 21 | 75 lbs/ac | 1,575 |
| Weirs | ---- | ---- | ---- | ---- |

| Postproject Name | Flow Condition | Acres | Standing Crop | Total Pounds |
|---|---|---|---|---|
| Channels | Intermittent | 19 | 20 lbs/ac | 380 |
| Channels | Ponded | 21 | 75 lbs/ac | 1,575 |
| Weirs | Permanent Water | 147 | 30 lbs/ac | 4,410 |

The 277-acre loss of forested habitat will be partially mitigated by planting the 134 acres of spoil in forest land with hardwood seedlings. The berm area in forest land amounts to 96 acres. Only scattered trees will be allowed to grow on the berm because of maintenance requirements. However, the spacing of the hardwood seedlings along the spoil and the existing trees that will be left along the edges of the channels will provide "full stocking" of the entire rights-of-way. The berm will be vegetated with grasses which will provide forage for forest wildlife species. The 134 acres of spoil area that will be planted in hardwood seedlings represents the total acreage of spoil in forest land. Seedling of the following species will be used depending on soil types and availability--water oak, sweet pecan, willow oak, and nuttal oak.

The following specific measures will be used to eliminate or minimize adverse effects to the plant, animal, and aquatic resources:

1. Excavation in forest land will be limited to the side of the channel with the poorest quality habitat.

2. Excavation in forest land will be minimized.

3. Excavation where possible will be accomplished from only one side of the channel to preserve the bank cover on the opposite side.

4. Excavation of all surveyed channels will be terminated well in advance of their confluences with the outlets.

5. Areas disturbed by construction will be seeded with plants beneficial to game and nongame species.

6. Structures for water control (weirs) will be installed before channel work begins.

7. A monitoring program is in progress and will detect any decreases of fish populations; arrangements have been made to correct any losses.

## Land Use Changes

Future land use in the watershed under "without project" and "with project" conditions is expected to be as follows:

| | FUTURE WITHOUT | | FUTURE WITH | |
|---|---|---|---|---|
| Land Use | Acres | Percent | Acres | Percent |
| Cropland | 117,900 | 60 | 117,900 | 60 |
| Pastureland | 27,400 | 14 | 27,400 | 14 |
| Forest Land | 36,900 | 19 | 36,600 | 19 |
| Other[a/] | 13,800 | 7 | 14,100 | 7 |
| Total | 196,000 | 100 | 196,000 | 100 |

a/ Includes roads, channels, bayous, lakes, communities, farmsteads, rights-of-way, etc.

The preceding tabulation reflects permenant land use changes from one category to another. The net effects of this change in land use attributed to channel work will result in no significant change of acreage of open land. The majority of disturbed open land will revert to its present use. Forest land will be reduced by approximately 300 acres. "Other land" use will be increased by about 300 acres. This increase represents the area required by the channels.

A summary of the land use changes shows that under "Future Without Project," 1,239 acres of land in the watershed taken up by channel rights-of-way will increase to 2,279 acres with the project. The following data summarizes the above discussion by wildlife habitat types.

| FUTURE WITHOUT PROJECT | | FUTURE WITH PROJECT | |
|---|---|---|---|
| Land Use | Acreage in Channel Rights-of-Way | Land Use | Acreage in Channel Rights-of-Way |
| Open Land | 306 | Open Land | 699 |
| Forest Land | 336 | Forest Land | 600 |
| Wooded Channel Banks | 597 | Wooded Channel Banks | 980 |
| Total | 1,239 | | 2,279 |

## Operation and Maintenance

Operation and maintenance of all phases of the completed project will be the responsibility of the Sponsors. The Northeast and the Catahoula Soil and Water Conservation Districts, with technical assistance from the Soil Conservation Service, will assist and work with landowners to install and maintain land treatment measures. The objectives will be to maintain adequate drains, ground cover, and other practices which will protect and conserve soil and water resources. The Louisiana Forestry Commission, in cooperation with the U.S. Forest Service, will furnish the technical assistance necessary for maintaining the forest land treatment measures under the going Cooperative Forest Management Program. The Federal-State Cooperative Fire Control Program will continue to furnish fire protection for the watershed area.

Operation and maintenance of all phases of the completed structural measures will be the responsibility of the Catahoula Parish Police Jury and the Franklin Parish Water Commission. In addition to maintaining the 186 miles of channels with appurtenant structures proposed in the plan, they will continue to maintain the present flow conditions of those channels that are now adequate (36 miles), as indicated on the Project Map, Appendix C. There are 6 miles of channels and appurtenant structures in Catahoula Parish, 204 miles in Franklin Parish, and 12 miles on the Catahoula-Franklin Parish boundary. The methodical operation and maintenance of structural measures will insure proper functioning of these measures and realization of benefits.

A 4-mill tax was passed in March 1968 for the purpose of maintaining project channels. Should these funds prove inadequate, the Sponsors have agreed to provide additional financing by an increase in revenue from normal taxing procedures.

Channel maintenance includes periodic cleanouts necessary to restore channels to their planned capacities, patching of eroded areas or outs on channel banks, control of aquatic weeds, and repair or replacement of side inlets and other structures. Maintenance of structures for water control and grade stabilization structures include repairing rills around headwalls or wingwalls, replacing rock riprap as needed, maintaining or replacing vegetation on fills, repairing or replacing worn or broken parts, replacing short-life parts, and all other activities essential to the safety and functioning of the structure. Improvement of the aesthetics of the channel and structure sites shall be considered an important feature of the maintenance program.

Annual operation and maintenance expenses are $20,200 for periodic removal of sediment from channels, $91,900 for vegetative

control, and $3,600 for repair and replacement of pipe structures, for a total annual cost of $115,700. The annual cost of operation and maintenance for Catahoula Parish is $8,400 and for Franklin Parish is $107,300.

Existing public roads, farm roads, turn rows, trails, open areas, and other existing facilities will be used for maintenance equipment to reach the channels. Sufficient access is available to properly maintain all channels. The channels will be kept clear of excessive vegetation by mowing, hand labor, and use of approved herbicides. Herbicides such as ammonium sulfamate, bromacil, and others registered with the Environmental Protection Agency (EPA) and approved by the United States Department of Agriculture (USDA) will be applied in a manner consistent with their labeling. Copper sulfate and cutrine will be used to control algae before excessive "blooms" develop in areas upstream from the 28 structures for water control (weirs). Pesticides presently approved will not preclude the use of other EPA-registered and USDA-approved pesticides developed during the life of the project. Herbicides will be used in areas where mowing and hand labor are not practical. Spraying will be accomplished in the summer months when the ephemeral channels and the intermittent channels have no water. Spraying during these months will lower the probability of water pollution from herbicides. Eroded banks, side inlets, and other appurtenances will be repaired when in need. Sediment accumulations (mud bars) will be removed periodically by mechanical means.

Trees remaining on channel banks not disturbed during construction will be maintained. Trees left in channel rights-of-way for landscape purposes and those planted on spoil banks in the forest areas will not be destroyed by maintenance methods. Two mechanical cleanouts are anticipated during the life of the project. The amount of sediment to be removed each time will be small enough to be placed and smoothed on the berm.

Provisions will be made for representatives of the Soil Conservation Service, the Louisiana Department of Public Works, and the Sponsors to have free access to all portions of the works of improvement at any reasonable time for the purpose of inspection, repair, and maintenance. The Sponsors, together with representatives of the Soil Conservation Service, will make a joint inspection annually, after severe storms, and after the occurrence of any other unusual condition that might adversely affect the structural measures.

These joint inspections will continue for 3 years following installation of the structural measures. Inspection after the third year will be made by the Sponsors. They will prepare an annual report and send a copy to the Soil Conservation Service.

Items of inspection will include, but will not be limited to, (1) conditions of vegetative cover and growth, (2) need for removal of sediment bars and debris accumulations, (3) brush control in channels, and (4) general conditions.

The Sponsoring Local Organization fully understands its obligations for operation and maintenance and will execute a specific operation and maintenance agreement with the Soil Conservation Service prior to the execution of the project agreement for the installation of works of improvement. An example operation and maintenance agreement is given in appendix G.

## Project Costs

The total installation cost of the project is estimated to be \$9,224,300 of which \$5,179,300 is for land treatment measures and \$4,045,000 is for structural measures. Of the total \$9,224,300, about \$3,155,430 will be borne by Public Law 566 funds and \$6,068,870 by other funds. The total construction cost of structural measures is \$2,058,200 of which \$1,588,950 will be borne by Public Law 566 funds and \$469,250 by other funds.

# ENVIRONMENTAL SETTING

## Physical Resources

The East Franklin Watershed is in northeast Louisiana in the eastern half of Franklin Parish with small areas in the northeast corner of Catahoula Parish and the southeast corner of Richland Parish. It encompasses 184,000 acres in Franklin Parish, 11,500 acres in Catahoula Parish, and 500 acres in Richland Parish. The elongated area is bounded on the east by the Madison-Tensas parish boundary and on the west by a meander line approximately down the center of Franklin Parish to Boeuf River just above the mouth of Deer Creek. The southern boundary generally parallels the parish line in Catahoula Parish and follows the southern drainage divide of Deer Creek on the remaining portion.

The population, based on the 1970 census data, is about 8,900. Approximately 37 percent of this population is classified as rural farm. The remaining 63 percent is rural nonfarm. About 22 percent of this rural nonfarm population lives in the communities of Wisner and Gilbert, and the remainder is scattered throughout the watershed. Winnsboro, the parish seat of Franklin Parish, is about 3 miles west of the central portion of the watershed, and Monroe, the sixth largest city in the State, is approximately 40 miles to the northeast.

East Franklin Watershed is in the Ouachita River Basin of the Lower Mississippi Water Resource Region.1/ About half the watershed is in the Southern Mississippi Valley Alluvium Land Resource Area, and half is in the Southern Mississippi Valley Silty Upland Land Resource Area.2/ A geologic map compiled by Rufus J. LeBlanc3/ shows the eastern part of the watershed as "Recent" braided stream deposits. The Southern Mississippi Valley Silty Upland Land Resource Area portion is a terrace formed by the Mississippi River with a narrow Pleistocene ridge rising sone 20 feet above the surrounding terrace. The terrace has a cap of loess. The entire area was formed during the Quaternary System of the Cenozoic Era.

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1/ U.S. Department of Agriculture, Soil Conservation Service, Atlas of River Basins of the United States (Washington: U.S. Government Printing Office, 1970), Map No. 15.

2/ U.S. Department of Agriculture Handbook No. 296, Land Resource Regions and Major Land Resource Areas of the United States (Washington: U.S. Government Printing Office, 1965), pp. 59-60.

3/ Rufus J. LeBlanc, Geologic Map of Louisiana (A map compiled from several sources of data, Baton Rouge, Louisiana, 1948).

SETTING

As a basis for conservation planning, the soils in this watershed are grouped in accordance with the land capability classification system.4/ These groupings are based on the limitation of the soil, risk of damage, and response of crops to treatment. In the capability system, all kinds of soils are grouped at three levels - the capability class, the subclass, and the unit.

Capability Classes, the broadest group, are designated by Roman numerals I through VIII. In Class I are soils that have few limitations, the widest range of use, and the least risk of damage when they are used. The soils in the other classes have progressively greater natural limitations. In Class VIII are soils and landforms so rough, so shallow, or otherwise so limited that they do not produce worthwhile yields of crops, forage, or wood products. Classes I, II, and III are suitable for cropland, Class IV is marginal, and Class V through Class VIII are unsuited for cropland.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, "e" or "w," to the class numeral, for example, IIw. The letter "e" shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; "w" shows that water in or on the soil interferes with plant growth or cultivation.

Soils are grouped according to their distinctive proportional pattern on the landscape. These groupings are called soil associations. A soil association normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another but in a different pattern.

The principal soil associations are Sharkey-Tensas, Grenada-Calloway-Calhoun, Grenada-Memphis, and Dundee Association.5/ See General Soil Map on the following page. The Sharkey-Tensas Association is the dominant association, comprising about 41 percent of the watershed. The soils in this association are high in natural fertility and occur in low, nearly level to gently undulating areas away from the natural levees in the eastern part of the watershed. Where undulating conditions exist, Sharkey soils are in the swales or lows, and Tensas soils are on

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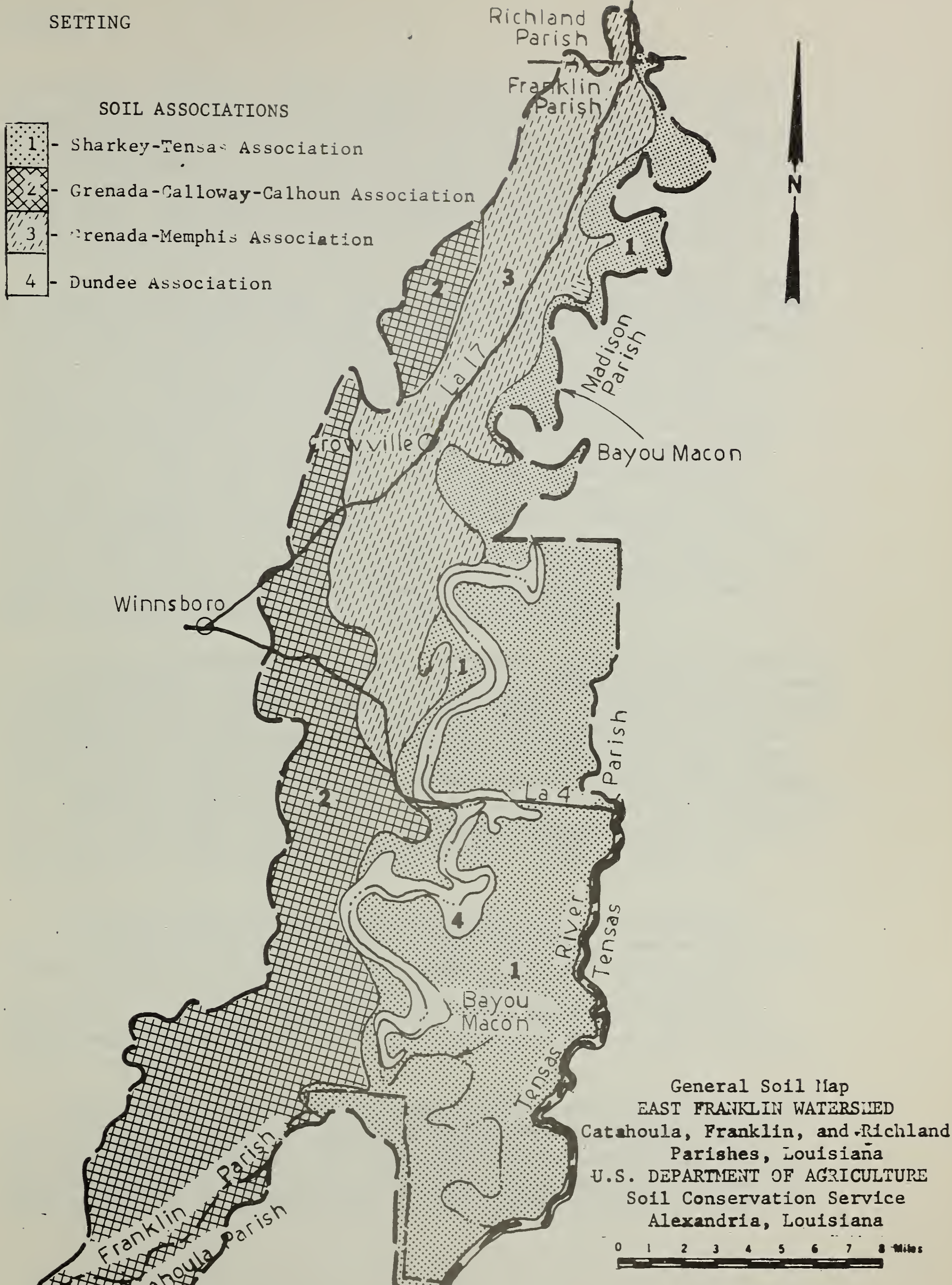
4/ A. A. Klingebeil and P. H. Montgomery, "Land Capability Classification," U.S. Department of Agriculture, Soil Conservation Service, Agriculture Handbook No. 210 (1961), p. 21.

5/ U.S. Department of Agriculture, Soil Conservation Service, "Franklin Parish, Louisiana," General Soil Map, Alexandria, Louisiana, 1971.

SETTING




Compiled from Soil Conservation Service General Soil Maps of Catahoula, Franklin, and Richland Parishes, Louisiana, April 1974

the ridges. Because of their clayey surface textures, these soils cannot be worked over a wide range of moisture conditions. The native vegetation of this association was mixed hardwoods with dense understory, but these soils are now used mostly for soybean production. Wetness, combined with the clayey texture, is the chief limitation of these soils. The majority of the Sharkey and Tensas soils is in Capability Class IIIw and minor areas are in Class IVw and Class V.

The Grenada-Calloway-Calhoun Association comprises approximately 32 percent of the watershed. These are silty soils that occur on the nearly level to gently undulating uplands. The Grenada and Calloway soils have a compact layer (fragipan) beneath the surface which restricts the movement of moisture within the soil. In level areas, wetness is a limitation for crop production and the soils are in Capability Class IIw. On slopes, they are also subject to erosion and are in Capability Class IIe. Calhoun soils are in Capability Class IIIw. They occur in slight depressions in the nearly level areas and in the swales (lows) in the undulating areas. Wetness caused by ponding or slow runoff is the dominant limitation. The natural fertility of the soils in this association is low, but crops respond fairly well to the recommended fertilizers. The native vegetation was pine and mixed hardwoods. The soils are now used to grow the common agronomic crops suited to the area.

The Grenada-Memphis Association comprises approximately 21 percent of the watershed. These are silty soils that occur on the nearly level to gently sloping uplands. Water perched above a compact layer beneath the surface is the dominant limitation of the Grenada soils. Where these soils are level, they are in Capability Class IIw. On slopes, erosion becomes the dominant problem and they are in Capability Class IIe. Memphis soils are on slopes and are subject to erosion (Capability Class IIe and IIIe). Both soils in the association are low in natural fertility, but crops respond moderately well to the recommended fertilizer.

The Dundee Association is a minor association in the bottom land and comprises only 6 percent of the watershed. Dundee soils are on the nearly level to very gently sloping natural levees of Bayou Macon, and are in Capability Class IIw. Wetness is the dominant limitation. The native vegetation was mixed hardwoods with dense understories. Now, nearly all these soils are used to grow soybeans, cotton, and corn.

The topography of the bottom land reflects the age, the type of soil material, and the environmental conditions under which the materials were deposited. The elevations of the natural levee along Bayou Macon range from about 75 feet above mean sea level in the northern portion to about 65 feet in the southern portion. From the

toe of this natural levee east to the Tensas River, a distance of about 10 miles, elevations are about 10 feet lower. The drainage pattern is the trellis type. It is poorly developed because the area is flat and geologically young. Lakes such as Lake Dean, Little Cow Lake, Middle Lake, and Beeler Lake are in old meander scars of distributaries. Bayous connect these lakes with the Tensas River so that water levels in the lakes fluctuate with water levels in the Tensas River.

The topography of the upland ranges from nearly level to gently sloping with the ridge in the northern portion being pronouncedly more steep than the remainder of the upland section. The ridge, situated in a north-south direction, has an average elevation of 105 feet above mean sea level, with a few points being near 130 feet. Within a distance of 2 miles to the east and west, the ridge slopes to elevations of about 85 feet above mean sea level. Ground elevations with a 30-mile distance vary from 65 feet at the southern end to 90 feet at the northern end. The natural drainage is to the south along the ridge, rather than to the east or to the west. The loess mantle is about 10 feet thick at the escarpment near Bayou Macon, and it thins to the west. See geologic profile B-B' on the following page. The area was created as a series of terraces during the development of the Mississippi River. Stages (A, A2, B1, B2, etc.) shown in the geologic profiles represent geomorphic development of the Mississippi River. See profile along line C-C' and D-D'. The geologic age of the area is interpreted from the terraces. Terraces between stages A1 through B2 are less than 6,000 years old. The extreme youth of the area, the thinning of the loess, and the terrace development account for the southerly drainage. Should the drainage pattern be changed as would eventually happen under natural drainage pattern development, the area would suffer extreme erosion.

The average annual rainfall is about 52 inches. Seasonal distribution is as follows: winter - 30 percent, spring - 30 percent, summer - 22 percent, and fall - 18 percent. The average annual temperature is about 66 degrees Fahrenheit. The average monthly temperature in January and July is about 50 degrees and 83 degrees Fahrenheit, respectively.[6] The average frost-free period of 243 days extends from March 9 to November 6.[7]

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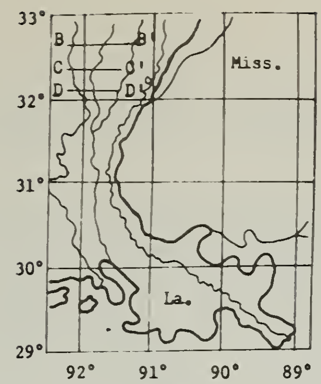
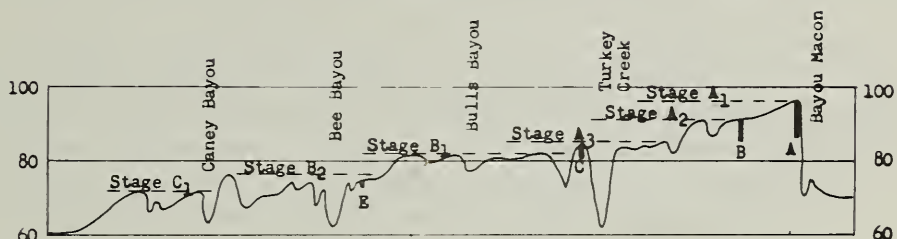
[6] U.S. Department of Commerce, Environmental Data Service, Climatological Data, Louisiana Annual Summary, 1972 (Asheville: National Oceanic and Atmospheric Administration, 1973), p. 159.

[7] U.S. Department of Commerce, Weather Bureau, Climates of the States, Louisiana (Washington: U. S. Government Printing Office, 1959), p. 6.

## GEOLOGIC PROFILES



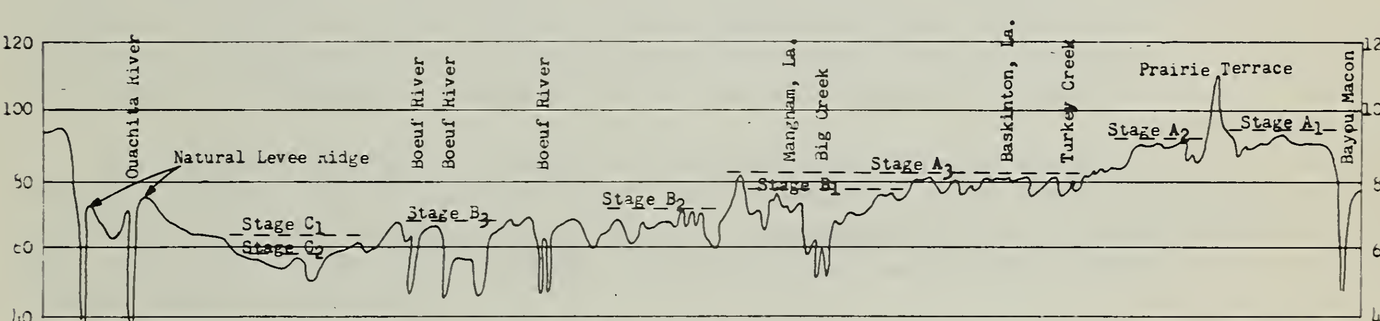

Location Map




Profile along Line B-B' 1/

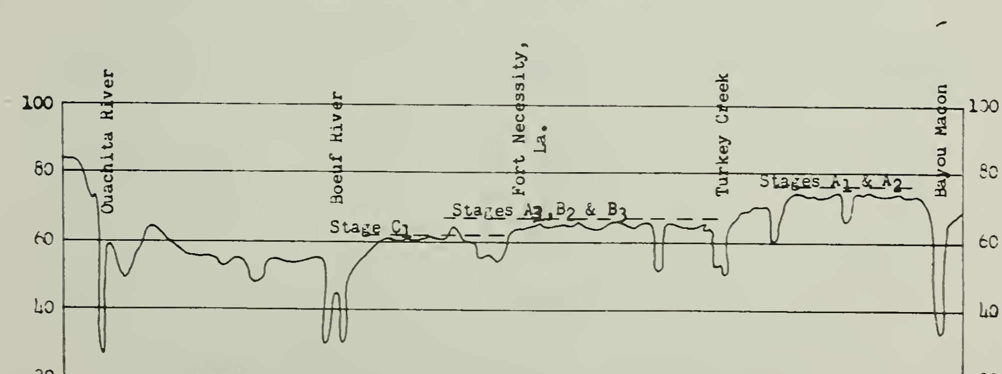
Depth of Loess below Land Surface

Site A - 126"  Site C - 45"
Site B - 70"  Site E - 12"




Profile along Line C-C' 2/

Relationship of Land Surface to the Geologic
Stages of Development of the Mississippi River




Profile along Line D-D' 2/

Relationship of Land Surface to the Geologic
Stages of Development of the Mississippi River

Source:

1/ Soil Conservation Service, Alexandria, La. "Work by David F. Slusher, 1963.

2/ Geological Investigation of the Alluvial Valley of the Lower Mississippi River,
Harold N. Fisk, Ph.D. Mississippi River Commission, 1944.

Oil, gas, and gravel are produced within the watershed. No commercial clay deposits occur.

Prior to 1935, 32 drilling permits had been issued in Franklin Parish, but there had been no oil and gas production. At the present time, three fields - the Egypt Ferry, Killens' Ferry, and Lamar Fields - are producing; three have been depleted. In 1967, the value of oil and gas production amounted to $4,119,000. In 1968, this declined to $2,188,000; six exploratory holes were drilled, but these were dry.

At the extreme southwestern end of the watershed, there are approximately 1,000 acres of upland. This is a part of "Sicily Island." Locally, this "island" is capped by Montgomery Terrace Deposits of Pleistocene Age. Gravel pits are located within the watershed in this deposit. Salt domes are in the vicinity of Crowville and Gilbert, but they have not been productive.

The primary and probably the only source of ground water is from the Quaternary Alluvial Deposits. Wells have a potential for yields up to 6,500 gallons per minute. The water is very hard and has a high iron content. The water is well suited for irrigating crops. A ridge of high chloride content lies immediately west of the watershed. Although this ridge is located outside the watershed, it could have influence in some wells along the western border.

In Franklin Parish in 1969, 5.62 million gallons of water a day were pumped for irrigation from the alluvial aquifer. The elevation of the base of the freshwater aquifer is approximately 100 feet below mean sea level. The total usage of ground water amounted to 9.16 million gallons per day.

Land use in the watershed is as follows:

| Land Use | Acres | Percent |
|---|---|---|
| Cropland | 117,300 | 60 |
| Pastureland | 28,000 | 14 |
| Forest Land | 36,900 | 19 |
| Other[a/] | 13,800 | 7 |
| TOTAL | 196,000 | 100 |

a/ Includes roads, railroads, communities, lakes, channels, farmsteads, on-farm miscellaneous, etc.

Large tracts of crop and pasture with interspersed forest land plots are typical. The three exceptions are (1) a forested tract of about 10,000 acres located north of Louisiana Highway 4 between Bayou Macon and Big Roaring Bayou, (2) a forested tract of about 1,000 acres

located between Bayou Macon and the lower end of Channel M-4, and (3) a forested tract of about 1,000 acres located at Sicily Island.

Southern hardwoods make up the dominant forest in the watershed area. Thirteen percent of the forested area is well stocked and 70 percent is medium stocked with commercially valuable species. (Well stocked means about 70 percent of the stand is composed of commercially valuable species and medium stocked means from 40 to 70 percent of the stand is composed of commercially valuable species.) The total acreage of the watershed forest lands is classified as 3 percent good quality hardwoods, 95 percent fair quality hardwoods, and 2 percent cypress.

Two plant communities are present in the forested areas. The larger in size, bottom land hardwoods, comprises about 35,900 acres; the other, mixed pine-hardwoods is approximately 1,000 acres in size and occurs in the extreme southwestern portion of the watershed.

Overstory vegetation in the bottom land hardwood plant community includes hackberry, elm, water locust, green ash, overcup oak, water oak, bitter pecan, nuttall oak, bald cypress, tupelo gum, and willow oak. Understory vegetation consists of greenbriar, palmetto, switchcane, trumpetcreeper, Japanese honeysuckle, blackberry, dewberry, sumac, paspalums, panic grasses, andropogons, various sedges and rushes, ferns, and reproduction from overstory species.

Overstory vegetation found in the mixed pine-hardwood plant community includes Southern red oak, white oak, loblolly pine, white ash, hornbeam, willow oak, water oak, and sweet gum. Understory plants include blackberry, rattan vine, wild grape, sumac, American beauty berry, fringetree, huckleberry, and greenbriar.

Before farming became prominent in this area, the natural drainage system consisted of a pattern of creeks, bayous, and wide natural depressions. The demand for food and fiber generated more interest in the area, and a drainage improvement program was initiated which included enlarging and clearing out these natural depressions. Most of the ditches that comprise the present drainage system have been dug, and in some cases, more than once. The geometric configuration and alignment of the water courses have been altered. Cleaning these channels over the past 50 years has resulted in the present outlet system of manmade "drainage ditches." The wide, natural depressions of the early drainage pattern have been altered to form the present "ditch system." The photographs on the following page show typical ditch sections.

Boeuf River, Bayou Macon, and Tensas River are the main streams into which the runoff from the watershed discharges; Deer Creek is the principal channel that drains the watershed. The remaining drainage system is manmade ditches dug in wide, shallow depressions. A number of bayous and swales in undisturbed wooded areas drain into Bayou Macon and Boeuf River. About 20 years ago, the Louisiana Department of Public Works diverted a portion of Deer Creek into Bayou Macon (see project map).

Typical Section of an Enlarged Channel

Typical Section of a Manmade Ditch

SETTING

Deer Creek was enlarged in two sections - (1) from Highway 15 south of Wisner to Highway 562 northeast of Wisner, and (2) all the portion north of the Bayou Macon diversion.

An inventory of the existing drainage system was made to determine the type of channels and flow characteristics. The inventory showed that 77 percent are manmade or previously modified channels and 23 percent are natural, unmodified channels. Eighty-eight percent of the channels have ephemeral flow characteristics, 9 percent have intermittent flow, and 3 percent have ponded water.

The total surface area in lakes and ponds is 1,706 acres and most are used for several purposes. Seventy of the ponds are devoted to commercial catfish production. Two of the lakes have project channels draining into them. These are Bayou Macon "cutoff Nos. 2 and 3." The following chart lists the names and approximate size in surface acres of the lakes and ponds in the watershed:

| Name | Approximate Size in Surface Acres |
|---|---|
| Twin Lakes | 16 |
| Little Lake | 2 |
| Moon Lake #1 | 3 |
| Green Lake | 21 |
| East Lake | 15 |
| Batese Lake | 3 |
| Lake Dean | 90 |
| Big Cow Lake | 19 |
| Calf Lake | 2 |
| Little Cow Lake | 15 |
| Middle Lake | 6 |
| Moon Lake #2 | 8 |
| Johnson Lake | 3 |
| Beeler Lake | 20 |
| Hog Lake | 15 |
| Harris Lake | 16 |
| Hollywood Lake | 27 |
| Bayou Macon Cutoff #3 | 138 |
| Bayou Macon Cutoff #2 | 140 |
| Bayou Macon Cutoff #1 | 238 |
| Unnamed Lakes | 44 |
| Farm Ponds (Multiple Use) | 75 |
| Catfish Ponds | 790 |
| TOTAL | 1,706 |

## Coding System for Inventory of Channel Work

| | | |
|---|---|---|
| Type of Work | I - | establishment of new channel including necessary stabilization measures |
| | II - | enlargement or realignment of existing channel or stream |
| | III - | cleaning out natural or manmade channel (includes bar removal and major clearing and snagging operation) |
| | IV - | clearing and removal of loose debris within channel section |
| | V - | stabilization, by continuous treatment or treatment of localized problem areas, as primary purpose (present capacity adequate) |
| | VI - | adequate |
| Type of channel Prior to Project | N - | an unmodified, well-defined natural channel or stream |
| | M - | manmade ditch or previously modified channel |
| | O - | none or practically no defined channel |
| Flow Condition Prior to Project | Pr - | perennial - flows at all times except during extreme drought |
| | I - | intermittent - continuous flow through some seasons of the year but little or no flow through other seasons |
| | E - | ephemeral - flows only during periods of surface runoff |
| | S - | ponded water with no noticeable flow, caused by lack of outlet or high ground-water level |

SETTING

The Louisiana Stream Control Commission has described portions of interstate streams, coastal waters, and streams discharging into coastal waters in the State according to present use. The Commission has also established quality standards which apply to these streams and their intrastate navigable tributaries and water bodies. Boeuf River and Bayou Macon are the only two streams classified by the Commission which influence or are influenced by this project.

The present uses of water from Boeuf River and Bayou Macon are irrigation, watering of livestock, propagation of aquatic life, recreation, municipal water supply, and carriage of minor amounts of treated municipal and industrial wastes. Anticipated future uses are municipal and industrial water supplies and considerable increases of most existing uses. General criteria for water quality standards state:

> "No waste after discharge to the Boeuf River shall create conditions which will adversely affect public health or the use of its water for municipal or industrial supplies, propagation of aquatic life, recreation, agriculture, and other legitimate uses."

Specific criteria for water quality standards as published in "Water Quality Criteria and Plan for Implementation"8/ are identical for Boeuf River and Bayou Macon except for the pH range. The pH range for Boeuf River is from 6 to 8.5 and for Bayou Macon is from 6 to 9. Identical criteria as published are:

| | |
|---|---|
| Dissolved Oxygen | - Not less than 50 percent of saturation at the existing water temperature. |
| Temperature | - Not to be raised more than 2 degrees C above normal ambient water temperature, not to exceed a maximum of 35 degrees C. |
| Oils | - There shall be no slicks of free or floating oil present in sufficient quantities to interfere with the designated uses, nor shall emulsified oils be present in sufficient quantities to interfere with the designated uses. |

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8/ State of Louisiana, Louisiana Stream Control Commission, Water Quality Criteria and Plan for Implementation (Unpublished report, 1968) pp. 69-72.

| | |
|---|---|
| Toxic Materials | - None present in quantities that alone or in combination will be toxic to animal or plant life. In all cases, the level shall not exceed the TLM 48/10.a/ |
| Foaming or Frothing Materials | - None of a persistent nature. |
| Coliforms (MPN/100 ml)b/ | - The monthly median shall not exceed 1600/100 ml, nor shall this count exceed 5420/100 ml in more than 10 percent of the samples in any one month. |
| Other Materials | - Limits on other substances not heretofore specified shall be in accordance with recommendations set by the Louisiana Stream Control Commission or by the Louisiana State Board of Health for municipal raw water sources. |

a/ Median tolerance limit signifying the concentration that kills 10 percent of the test organisms within 48 hours.

b/ Most probable number.

The Division of Water Pollution Control of the Louisiana Wild Life and Fisheries Commission has monitored water quality in Tensas River and Bayou Macon for several years. Water samples used in these tests were obtained monthly at the U.S. Highway 80 bridge at Tendal for the Tensas River and the U.S. Highway 80 bridge at Delhi for Bayou Macon. The tabulations on the following pages show the results of 6 years of monitoring the water quality.

Wetlands, as defined in USDI Circular No. 39[9/], comprise 4,340 acres. Of this total, 3,265 acres are Type 1 wetlands, 4 acres are Type 4 wetlands, 430 acres are Type 5 wetlands, and 641 acres are Type 7 wetlands. A summary of wetland data is on the following page.

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9/ U.S. Department of the Interior, Fish and Wildlife Service, Wetlands of the United States, Circular No. 39 (Washington: U.S. Government Printing Office, 1956), pp. 20-22.

Water Quality Data - Tensas River, U. S. Highway 80 Bridge at Tendal[a/]

| Year | pH (UNITS) | Diss. Oxygen (PPM) | Oxygen Saturation (PERCENT) | Temp (°C) | Turbid-ity (UNITS) | True Color (UNITS) | Susp. Solids (PPM) | Diss. Solids (PPM) | Total Solids (PPM) | Specific Conductance (UMHOS/CM$^2$) | Total Hardness (PPM) | Total Alkal. (PPM) | Sul-fates (PPM) | Chlorides (PPM) | Sodium (PPM) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1973 Mean | 7.3 | 7.2 | 76 | 19 | 68 | 70 | 81 | 220 | 301 | 268 | 122 | 123 | 5 | 25 | 21 |
| Maximum | 8.5 F[b/] | 11.5 S | 147 S | 29 S | 165 W | 200 W | 234 W | 452 Sp | 552 Sp | 520 S | 233 F | 293 F | 12 S | 78 Sp | 61 S |
| Minimum | 6.0 Sp | 3.5 S | 44 S | 8 W | 2 S | 10 F | 2 S | 8 Sp | 92 Sp | 115 Sp | 62 Sp | 5 Sp | 0 Sp | 7 S | 0 Sp |
| 1972 Mean | 7.6 | 6.6 | 69 | 20 | 85 | 42 | 93 | 224 | 317 | 302 | 129 | 105 | 13 | 38 | 26 |
| Maximum | 8.3 Sp | 11.2 W | 92 W | 29 F | 250 Sp | 60 Sp | 378 W | 526 Sp | 562 Sp | 580 F | 258 F | 220 F | 31 S | 92 W | 113 S |
| Minimum | 6.9 Sp | 3.7 S | 47 S | 7W | 10 F | 5 S | 6 F | 20 F | 50 F | 60 W | 30 W | 36 W | 0 F | 9 W | 5 W |
| 1971 Mean | 7.7 | 6.8 | 70 | 18 | 86 | 53 | 64 | 275 | 340 | 317 | 131 | 160 | 16 | 25 | 64 |
| Maximum | 8.2 F | 9.3 S | 111 S | 28 F | 190 Sp | 160 S | 180 S | 778 Sp | 880 Sp | 600 W | 274 F | 290 W | 27 W | 66 F | 180 S |
| Minimum | 7.2 Sp | 3.6 S | 44 S | 4 W | 8 F | 15 F | 6 F | 48 S | 76 F | 170 Sp | 59 W | 54 Sp | 4 F | 6 Sp | 6 F |
| 1970 Mean | 7.3 | 4.9 | 49 | 20 | 197 | 43 | 150 | 269 | 418 | 246 | 103 | 103 | 15 | 8 | 18 |
| Maximum | 8.1 F | 9.4 W | 77 W | 32 S | 950 W | 70 F | 494 S | 704 W | 990 W | 480 F | 200 F | 230 F | 32 F | 14 F | 87 F |
| Minimum | 6.5 Sp | 0.3 F | 4 F | 4 W | 17 F | 30 F | 0 F | 120 S | 154 S | 140 W | 62 W | 41 W | 3 S | 6 Sp | 7 Sp |
| 1969 Mean | 7.3 | 8.6 | 86 | 19 | 77 | 30 | 112 | 208 | 323 | 379 | 187 | 159 | 14 | 19 | 20 |
| Maximum | 8.2 F | 12.0 W | 133 F | 29 S | 140 Sp | 40 Sp | 324 S | 392 F | 440 F | 640 F | 290 W | 288 W | 22 S | 35 Sp | 39 F |
| Minimum | 6.7 F | 5.4 S | 64 S | 7 W | 30 F | 20 F | 8 F | 38 Sp | 176 Sp | 190 Sp | 81 W | 69 W | 7 W | 6 Sp | 6 W |
| 1968 Mean | 7.3 | 6.5 | 68 | 19 | 106 | 38 | 80 | 245 | 325 | 355 | 104 | 119 | 15 | 13 | 80 |
| Maximum | 8.2 F | 8.4 W | 87 F | 30 S | 280 W | 75 W | 396 W | 326 F | 558 W | 580 F | 192 F | 252 F | 28 Sp | 26 S | 396 W |
| Minimum | 6.4 S | 3.8 S | 45 Sp | 3 W | 30 F | 10 F | 0 S | 152 Sp | 176 W | 156 W | 28 W | 12 W | 4 F | 4 W | 0 S |
| 1968-73 Average Mean | 7.4 | 6.8 | 70 | 19 | 103 | 46 | 97 | 240 | 337 | 311 | 129 | 128 | 13 | 21 | 38 |
| Maximum | 8.3 | 10.3 | 108 | 30 | 290 | 101 | 334 | 530 | 664 | 567 | 241 | 262 | 25 | 52 | 146 |
| Minimum | 6.6 | 3.4 | 41 | 6 | 16 | 15 | 4 | 64 | 121 | 139 | 54 | 35 | 3 | 6 | 4 |

a/ Unpublished Data. Louisiana Wild Life and Fisheries Commission. Division of Water Pollution Control.

b/ Sp = March, April, May
S = June, July, August
F = September, October, November
W = December, January, February

Water Quality Data - Bayou Macon, U.S. Highway 80 Bridge at Delhi [a/]

| Year | pH (UNITS) | Diss. Oxygen (PPM) | Oxygen Saturation (PERCENT) | Temp. (°C) | Turbid-ity (UNITS) | True Color (UNITS) | Susp. Solids (PPM) | Diss. Solids (PPM) | Total Solids (PPM) | Specific Conductance (UMHOS/CM$^2$) | Total Hardness (PPM) | Total Alkal. (PPM) | Sul-fates (PPM) | Chlorides (PPM) | Sodium (PPM) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1973 Mean | 7.6 | 8.1 | 84 | 19 | 85 | 57 | 89 | 217 | 306 | 207 | 100 | 98 | 9 | 16 | 7 |
| Maximum | 9.0 Sp [b/] | 11.4 W | 98 W | 29 S | 200 W | 80 S | 278 Sp | 496 Sp | 642 Sp | 370 S | 179 S | 174 S | 19 S | 49 S | 19 S |
| Minimum | 6.0 W | 5.5 S | 67 S | 8 W | 15 S | 20 S | 2 S | 4 W | 110 W | 94 Sp | 53 W | 44 Sp | 0 Sp | 5 Sp | 0 Sp |
| 1972 Mean | 7.8 | 8.1 | 87 | 20 | 81 | 50 | 110 | 268 | 379 | 286 | 124 | 117 | 14 | 41 | 14 |
| Maximum | 8.2 Sp | 11.2 W | 112 S | 30 S | 240 W | 80 W | 456 Sp | 384 F | 610 Sp | 480 S | 405 S | 222 S | 42 Sp | 136 W | 30 W |
| Minimum | 7.0 Sp | 5.7 F | 65 F | 7 W | 15 S | 5 S | 4 F | 36 Sp | 200 W | 50 Sp | 35 W | 34 W | 1 S | 12 Sp | 3 W |
| 1971 Mean | 7.7 | 8.3 | 85 | 18 | 134 | 40 | 125 | 332 | 457 | 309 | 105 | 129 | 25 | 23 | 23 |
| Maximum | 8.3 F | 11.0 W | 111 S | 29 S | 480 W | 60 Sp | 394 Sp | 608 Sp | 706 Sp | 550 F | 211 W | 238 F | 83 W | 42 F | 99 Sp |
| Minimum | 7.1 Sp | 6.0 S | 65 Sp | 4 W | 8 F | 10 W | 30 F | 170 S | 302 S | 100 Sp | 8 F | 26 W | 2 F | 7 W | 9 W |
| 1970 Mean | 7.2 | 7.7 | 83 | 20 | 162 | 33 | 156 | 265 | 421 | 297 | 114 | 106 | 18 | 22 | 24 |
| Maximum | 7.8 F | 10.9 W | 121 S | 35 S | 450 Sp | 60 Sp | 944 Sp | 524 Sp | 992 W | 560 F | 228 F | 220 F | 30 W | 53 W | 85 F |
| Minimum | 6.4 Sp | 4.6 F | 61 F | 4 W | 21 W | 20 F | 0 F | 48 W | 192 W | 120 Sp | 54 W | 40 Sp | 0 F | 7 Sp | 6 Sp |
| 1969 Mean | 7.3 | 8.5 | 85 | 19 | 88 | 26 | 90 | 226 | 316 | 355 | 133 | 114 | 21 | 24 | 20 |
| Maximum | 8.4 F | 13.0 W | 115 W | 30 S | 180 W | 50 Sp | 312 S | 346 F | 472 S | 560 F | 230 F | 189 F | 31 F | 46 F | 29 F |
| Minimum | 6.6 W | 4.6 S | 54 S | 10 W | 30 F | 10 S | 12 F | 122 W | 230 W | 210 Sp | 45 W | 47 S | 7 W | 9 W | 6 W |
| 1968 Mean | 7.2 | 6.9 | 72 | 19 | 126 | 32 | 116 | 235 | 351 | 339 | 116 | 100 | 23 | 14 | 18 |
| Maximum | 8.0 F | 10.4 W | 92 S | 30 S | 360 W | 75 W | 332 W | 368 S | 566 W | 726 S | 215 F | 188 F | 38 Sp | 30 F | 36 F |
| Minimum | 6.4 S | 4.2 S | 52 S | 3 W | 30 F | 5 F | 0 S | 98 Sp | 170 W | 141 W | 38 W | 29 W | 3 F | 6 W | 4 W |
| 1968-73 Average | | | | | | | | | | | | | | | |
| Mean | 7.5 | 7.9 | 83 | 19 | 113 | 40 | 114 | 257 | 372 | 299 | 115 | 111 | 18 | 23 | 18 |
| Maximum | 8.3 | 11.3 | 108 | 31 | 318 | 68 | 453 | 454 | 665 | 541 | 245 | 205 | 41 | 59 | 50 |
| Minimum | 6.6 | 5.1 | 61 | 6 | 20 | 12 | 8 | 80 | 201 | 119 | 39 | 37 | 2 | 8 | 5 |

a/ Unpublished Data. Louisiana Wild Life and Fisheries Commission. Division of Water Pollution Control

b/ Sp = March, April, May
S = June, July, August
F = September, October, November
W = December, January, February

SETTING

| Type | Description | Acres |
|---|---|---|
| 1 | Seasonally flooded hardwoods | 3,265 |
| 4 | Inland, fresh marsh | 4 |
| 5 | Open lakes and ponds up to 10' deep | 430 |
| 7 | Cypress and tupelo gum brakes | 641 |
| TOTAL | | 4,340 |

Plant and Animal Resources

Lake Dean, other natural lakes, farm ponds, three manmade "cutoffs" on Bayou Macon (see Project Map, Appendix C), 7 miles of ponded water channels, and Bayou Macon, Tensas River, and Boeuf River contain the major fisheries. Of lesser importance are 22 miles of intermittent flow channels. There are no known "threatened" fish species in the project area.10/

The "cutoffs" are U-shaped bends, formerly the streambed of Bayou Macon, that have earthen levees separating them from Bayou Macon. Fish populations in two of the three Bayou Macon "cutoffs" were sampled using rotenone during September 1973 in cooperation with the Louisiana Wild Life and Fisheries Commission. Results from these samples are found on the following two pages. These indicate a standing crop of 294 pounds per acre for Bayou Macon "cutoff No. 2" and 195 pounds per acre for Bayou Macon "cutoff No. 3." The remaining lakes and multiple-use ponds not sampled have an estimated standing crop of 225 pounds per acre. Annual production from the commercial catfish ponds is about 1,500 pounds per acre. Important game and commercial fish species present in the lakes and ponds are largemouth bass, crappies, bluegill, redear sunfish, carp, and catfishes.

Bayou Macon, Tensas River, and Boeuf River are perennial streams partly within or adjacent to the project area. The diversity of fish species in these three streams is poor. The fish population is composed primarily of commercial species including carp, buffalo, gar, shad, and catfish. Few game fish are present. The three streams have an estimated standing crop of 100 pounds per acre.

Presently, water quality for fish production is poor in Boeuf River, Bayou Macon, and the Tensas River. Previous disturbances, the intensively-farmed drainage areas, and erosion of fine-grained soils have resulted in conditions that are not favorable for productive fisheries. Consequently, the majority of the fish population is composed of commercial species. The tabulation on page 38

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10/ Robert R. Miller, "Threatened Freshwater Fishes of the United States," Transactions of American Fisheries Society, No. 2 (Kansas: Allen Press, 1972), pp. 239-252.

BAYOU MACON CUTOFF NUMBER 2, CROWVILLE, LA.[a/]

Rotenone Data - 1 Acre Set

September 24 and 25, 1973

| Species | Fish of Available Size | | | Intermediate | | | Fingerlings | | | % |
|---|---|---|---|---|---|---|---|---|---|---|
| | Min. Length (In.) | Number/ Acre | Pounds/ Acre | Range in Length (In.) | Number/ Acre | Pounds/ Acre | Max. Length (In.) | Number/ Acre | Pounds/ Acre | Total Pounds |
| **Predatory Game Fish** | | | | | | | | | | |
| Chain Pickerel | xxx | xxx | xxx | xxx | xxx | xxx | 5.9 | 8 | .2 | |
| TOTAL | | | | | | | | 8 | .2 | Trace |
| **Non-Predatory Game Fish** | | | | | | | | | | |
| Bluegill | 5.0 | 167 | 14.4 | 3.0-4.9 | 371 | 9.1 | 2.9 | 575 | 1.8 | |
| Spotted sunfish | xxx | xxx | xxx | xxx | xxx | xxx | 2.9 | 115 | .4 | |
| Warmouth | xxx | xxx | xxx | 3.0-4.9 | 8 | .1 | xxx | xxx | xxx | |
| TOTAL | | 167 | 14.4 | | 379 | 9.2 | | 690 | 2.2 | 8.7 |
| **Non-Predatory Food Fish** | | | | | | | | | | |
| Spotted sucker | 12.0 | 4 | 3.0 | 5.0-11.9 | 2 | 1.9 | xxx | xxx | xxx | |
| Black bullhead | 7.0 | 1 | .6 | xxx | xxx | xxx | 4.9 | 1 | Trace | |
| Pirate perch | xxx | xxx | xxx | xxx | xxx | xxx | 4.9 | 66 | .3 | |
| TOTAL | | 5 | 3.6 | | 2 | 1.9 | | 67 | .3 | Trace |
| **Forage Fish** | | | | | | | | | | |
| Gizzard shad | 8.0 | 5 | 1.6 | 4.0-7.9 | 5635 | 184.9 | 3.9 | 2678 | 72.4 | |
| Threadfin shad | xxx | xxx | xxx | xxx | xxx | xxx | 3.9 | 70 | .9 | |
| Golden shiners | xxx | xxx | xxx | xxx | xxx | xxx | 3.9 | 205 | 1.9 | |
| Madtom | xxx | xxx | xxx | xxx | xxx | xxx | 3.9 | 31 | .2 | |
| TOTAL | | 5 | 1.6 | | 5635 | 184.9 | | 2984 | 75.4 | 89.1 |
| GRAND TOTAL | | 177 | 19.6 | | 6016 | 196.0 | | 3749 | 78.1 | 100 |

a/ Data developed in cooperation with Louisiana Wild Life and Fisheries Commission

Standing Crop = 293.7 lbs./acre

BAYOU MACON CUTOFF NUMBER 3, BAKERS, LA.[a]

Rotenone Data - 1 Acre Set

September 25 and 26, 1973

| Species | Fish of Available Size | | | Intermediate | | | Fingerlings | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Min. Length (In.) | Number/ Acre | Pounds/ Acre | Range in Length (In.) | Number/ Acre | Pounds/ Acre | Max. Length (In.) | Number/ Acre | Pounds/ Acre | % Total Pounds |
| **Predatory Game Fish** | | | | | | | | | | |
| Largemouth bass | 9.0 | 1 | 3.9 | 5.0-8.9 | 39 | 2.6 | 4.9 | 71 | 4.0 | |
| White crappie | 7.0 | 1 | .4 | xxx | xxx | xxx | xxx | xxx | xxx | |
| Black crappie | 7.0 | 2 | .8 | 5.0-6.9 | 134 | 6.5 | 4.9 | 4 | .1 | |
| TOTAL | | 4 | 5.1 | | 173 | 9.1 | | 75 | 4.1 | 9.3 |
| **Non-Predatory Game Fish** | | | | | | | | | | |
| Bluegill | 5.0 | 387 | 51.8 | 3.0-4.9 | 75 | 2.9 | xxx | xxx | xxx | |
| Redear sunfish | 5.0 | 23 | 7.2 | 3.0-4.9 | 41 | 2.2 | xxx | xxx | xxx | |
| Green sunfish | xxx | xxx | xxx | 3.0-4.9 | 9 | .6 | xxx | xxx | xxx | |
| Warmouth | 5.0 | 32 | 3.4 | 3.0-4.9 | 31 | 1.7 | xxx | xxx | xxx | |
| TOTAL | | 442 | 62.4 | | 156 | 7.4 | | | | 35.7 |
| **Non-Predatory Food Fish** | | | | | | | | | | |
| Carp | 14.0 | 2 | 15.8 | xxx | xxx | xxx | xxx | xxx | xxx | |
| Black bullhead | xxx | xxx | xxx | 5.0-6.9 | 2 | .1 | 4.9 | 91 | .6 | |
| TOTAL | | 2 | 15.8 | | 2 | .1 | | 91 | .6 | 8.4 |
| **Forage Fish** | | | | | | | | | | |
| Gizzard shad | 8.0 | 128 | 90.2 | xxx | xxx | xxx | xxx | xxx | xxx | |
| Golden shiners | 6.0 | 18 | .4 | xxx | xxx | xxx | xxx | xxx | xxx | |
| TOTAL | | 146 | 90.6 | | | | | | | 46.4 |
| GRAND TOTAL | | 594 | 173.9 | | 331 | 16.6 | | 166 | 4.7 | 100 |

a/ Data developed in cooperation with Louisiana Wild Life and Fisheries Commission

Standing Crop = 195.2 lbs./acre

illustrates some water quality parameters that are limiting fish production in Bayou Macon and Tensas River.

Yearly Average Values for Selected Water Quality Parameters
East Franklin Watershed a/

| Year | Turbidity | Dissolved Solids | Suspended Solids | True Color |
|---|---|---|---|---|
| --- | units | --milligrams per liters | ------- | units |
| | | BAYOU MACON | | |
| 1968 | 126 | 235 | 116 | 32 |
| 1969 | 88 | 226 | 90 | 26 |
| 1970 | 162 | 265 | 156 | 33 |
| 1971 | 134 | 332 | 125 | 40 |
| 1972 | 81 | 268 | 110 | 50 |
| 1973 | 85 | 217 | 89 | 57 |
| | | TENSAS RIVER | | |
| 1968 | 106 | 245 | 80 | 38 |
| 1969 | 77 | 208 | 112 | 30 |
| 1970 | 197 | 269 | 150 | 43 |
| 1971 | 86 | 275 | 64 | 53 |
| 1972 | 85 | 224 | 93 | 42 |
| 1973 | 68 | 220 | 81 | 70 |

a/ Unpublished data, Louisiana Wild Life and Fisheries Commission, Division of Water Pollution Control

Bayou Macon "cutoff No. 3" contains an excellent fishery. A fish population sample taken in September 1973 revealed a standing crop of 195 pounds per acre. Game fish composed 45 percent of the standing crop. The fish population is "in balance" according to species composition and age classes.

Bayou Macon "cutoff No. 2" contains an "out-of-balance" fish population. The sample taken in September 1973 showed that gizzard shad composed 88 percent or 259 pounds of the total sample. Game fish made up only 26 pounds or 9 percent of the total sample. Largemouth bass were absent from the sample. Chain pickerel was the only species of predatory game fish present.

Ponded water channels comprise about 7 miles and 21 surface acres. Fishery values are poor with standing crops estimated to be 75 pounds per acre. Composition of the fish population is similar to that of the Boeuf and Tensas Rivers and Bayou Macon.

Intermittent flow channels comprise about 22 miles and 59 surface acres. Almost all these are previously modified ditches. The fisheries in these ditches are low because flow conditions are poor, bank cover is inadequate, and water quality is poor. These channels have estimated standing crops of 20 pounds per acre during periods of flow; commercial species are dominant.

Channels with ephemeral flow are important to the production of fish food organisms such as crawfish and larval forms of insects, but do not support fisheries since water is present only during periods of surface runoff. The following data summarize the fisheries by categories:

FISHERIES DATA BY CATEGORIES

| Name | Acres | Standing Crop | Pounds |
|---|---|---|---|
| Catfish Ponds | 790 | 1,500 lbs./acre | 1,185,000 |
| Lakes and Ponds (Multiple Use) | 916 | 225 lbs./acre | 206,100 |
| Outlets | 735 | 100 lbs./acre | 73,500 |
| Ponded Water Channels | 21 | 75 lbs./acre | 1,575 |
| Intermittent Flow Channels | 59 | 20 lbs./acre | 1,180 |
| TOTAL | 2,521 | | 1,467,355 |

The fisheries are utilized heavily by local fishermen. The economy is boosted through sales of boats, motors, fishing tackle, gasoline, and other items. About 1,300 resident fishing licenses were sold in Franklin Parish during the 1970-71 fishing season.11/ This represents 11 percent of the total population between the ages of 16 and 60 years. Residents under 16 years or over 60 years and residents using a cane pole or rod without a reel and artificial lures are not required to buy a license to fish.

Access to the fisheries is good except for several small lakes along the Tensas River. These lakes do not have a good all-weather road to them. Four public launching ramps are available: two are on the Tensas River, one is on Bayou Macon "cutoff No. 1," and one is on Bayou Macon "cutoff No. 3." Several road crossings on the three outlets provide places to launch small fishing boats. Most multiple-use ponds have all-weather roads for access, and permission to fish usually can be obtained from the landowner.

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11/State of Louisiana, Louisiana Wild Life and Fisheries Commission, 14th Biennial Report 1970-71 (New Orleans: Louisiana Wild Life and Fisheries Commission, 1972).

Forest land habitat comprises about 36,900 acres within the watershed. This vegetative ecosystem supports some of the highest wildlife populations in the State. This acreage is in bottom land hardwoods except about 1,000 acres in the southwestern part of the area. Forest game species associated with forested habitat include white-tailed deer, wild turkey, gray and fox squirrels, and swamp and cottontail rabbits. Many nongame species use the forested areas for food and cover. Except for the three large forested tracts listed under "Physical Resources," the forest land occurs in small blocks. Almost all the good quality mast trees have been removed.

Open land, which includes pastureland and cropland, totals 145,300 acres. It is utilized by open land game species including the bobwhite quail, mourning dove, and cottontail rabbit as well as numerous nongame birds and mammals. Even so, populations of quail, doves, and rabbits are below the potential carrying capacity. This is a situation caused by a lack of winter cover, a lack of year round food supply, and for quail, a lack of nesting cover. Dove populations could be expected to be high in early fall and winter. However, in late fall (October), populations are lower. The tabulation on page 41 gives the current populations of forest and open land game species.

Other common mammals, birds, reptiles and amphibians present are the following:

1. Mammals - mink, beaver, nutria, raccoon, opossum, bobcat, stripped skunk, coyote, gray fox, cotton rat, and armadillo.

2. Birds - mallard, blue-winged teal, pintail, gadwall, common crow, pileated woodpecker, red-headed woodpecker, downy woodpecker, blue jay, belted kingfisher, barred owl, screech owl, brown thrasher, Eastern bluebird, Eastern meadowlark, Louisiana heron, yellow-crowned night heron, little blue heron, red-shouldered hawk, red-tailed hawk, and house sparrow.

3. Reptiles and amphibians - western cottonmouth, black rat snake, cane brake rattlesnake, Eastern garter snake, copperhead, king snake, bullfrog, Southern leopard frog, common snapping turtle, smooth softshell turtle, stinkpot turtle, red-eared turtle, green anole, five-lined skink, ground skink, Western slender glass lizzard, chicken turtle, and alligator snapping turtle.

Previously listed water areas are utilized by resident and migratory waterfowl. About 4,340 acres of wetlands also furnish habitat for waterfowl. The wetland types listed on page 35

CURRENT ESTIMATED POPULATIONS OF GAME SPECIES

East Franklin Watershed[a]

| Species | Habitat Type | Acres | Number Per Acre (s) | Total in Watershed |
|---|---|---|---|---|
| Dove | Open Land | 145,300 | 1/6 | 24,200 |
| Quail | Open Land | 145,300 | 1/50 | 2,900 |
| Squirrel | Forest Land | 36,900 | 1/1.5 | 24,600 |
| Deer | Forest Land | 36,900 | 1/20 | 1,845 |
| Rabbit | Forest Land & Open Land | 182,200 | 1/10 | 18,200 |
| Waterfowl (Resident) | Forest Land, Open Land, & Water Areas | 183,400 | 1/350 | 524 |
| Waterfowl (Migratory) | Forest Land, Open Land, & Water Areas | 183,400 | 1/15 | 12,226 |
| Wild Turkey | Forest Land | 36,900 | 1/100 | 370 |

a/ Data developed in cooperation with Louisiana Wild Life and Fisheries Commission.

form the nucleus of the waterfowl habitat. Wetlands are used by waterfowl for feeding, resting, and roosting; they serve as brood habitat for resident wood ducks. Other values of wetlands include the recharge of ground water, the retention of surface water for farm uses, the stabilization of runoff, the reduction or prevention of erosion, the production of timber, the creation of firebreaks, and outdoor laboratories for students studying ecology.12/

Several "endangered" species could possibly occur or be occasional visitors in the project area. In this category are the Southern bald eagle,

12/ U.S. Department of the Interior, Wetlands, loc. cit.

Typical Open Land Wildlife Habitat

Typical Forest Land Wildlife Habitat

Bachman's warbler, and American alligator. Although the black bear is not on the list of "endangered" species, it is considered rare in Louisiana and could possibly occur in the watershed. "Endangered" species are those which are on the verge of extinction.13/ There are no "threatened" plants listed for Franklin Parish from available literature. The "threatened plant" silky camellia has been reported from Catahoula Parish.14/

## Economic Resources

Public land consists of 155 acres administered by the Franklin Parish School Board and 120 acres administered by the Tensas Basin Levee District. All other land is privately owned.

There are three broad categories of industries in the economy of the region. In the first are the basic industries such as farming, mining, and forestry which are based on natural resources. The second category includes the processing industries such as cotton gins, grain elevators, petroleum refining plants, and lumber mills, which depend on the basic industries. The third category includes the service industries such as wholesale and retail stores, communications, transportation, medicine, etc., which are based on the other two industries as well as their own members.15/

Since forestry resources have been reduced and mineral deposits are limited, the major basic industry in the watershed is farming, as indicated by the following statistics. These statistics, developed from the 1970 census data for the rural farm and rural nonfarm segments of the Franklin Parish population, show that the labor force consists of about 2,200 persons. Of these, about 7 percent are unemployed; about 26 percent of the labor force are employed in agriculture, and about 4 percent are employed in other natural resource base industries such as

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13/ U.S. Department of the Interior, Fish and Wildlife Service, Threatened Wildlife of the United States, Resource Publication 114 (Washington: U.S. Government Printing Office, 1970), pp. 5-203.

14/ Unpublished Threatened Plant List for Louisiana, Soil Conservation Service, 1974.

15/ Gerald A. Doeksen, Robert E. Daughtry, and Charles H. Little, "Multiplier Effects of Agriculture and Other Industries," OSU Extension Facts, Science Serving Agriculture No. 808 (Stillwater: Oklahoma State University), pp. 808 and 808.1.

mining, forestry, or fisheries. About 20 percent of the labor force are employed in construction and manufacturing. The remaining employed labor force.(43 percent) are occupied in the service-type industries. Median income in the watershed was approximately $3,750 in 1970.

The major farm and ranch enterprises are soybeans, cotton, and cattle. The farm-related industries include several cotton gins, a feed mill, a food canning plant, a sweet potato warehouse, and an agricultural equipment fabricator. Several agricultural supply houses, a livestock auction barn, a cottom compress and warehouse, and other related businesses are located in the nearby town of Winnsboro.

Crops grown in the area include cotton, soybeans, corn, rice, grain sorghum, wheat, and hay. Pasture plants include Common bermudagrass, Coastal bermudagrass, dallisgrass, bahiagrass, fescue, ryegrass, and clover.

Soybeans and cotton are the major crops. The without-project yields in the problem area are 22 bushels of soybeans and 614 pounds of lint cotton per acre. Yield averages for the entire watershed are about 29 bushels of soybeans and 753 pounds of lint cotton per acre.

Average merchantable volume in sawtimber-size trees for the watershed is 1,170 board feet per acre of hardwoods, and 135 board feet per acre of cypress. Average merchantable volume in cordwood size trees is 167 cubic feet per acre of hardwoods and 9 cubic feet per acre of cypress. Another 197 cubic feet per acre of sound hardwood material is present in trees of poor quality.

Land values for agricultural purposes range from an estimated $200 per acre for poorly-drained soils to $400 per acre for well-drained soils. These values depend on location, soil type, and degree of conservation measures applied.

Approximately 500 miles of State and parish roads in the watershed provide good access. About 100 miles are hard-surfaced and about 400 miles are graveled. Parts of some gravel roads are under water after heavy rainfall. The railroad providing service had loading facilities at several points.

About 820 farms average 190 acres in size. About 90 percent are family-type farms; the remaining 10 percent are considered large, commercial-type farms.

## Recreational Resources

A 1970 inventory conducted by the Louisiana State Parks and Recreation Commission lists 18 recreational sites for Franklin Parish. According to the Bureau of Outdoor Recreation's land classes, 17 of

these are general recreation sites and 1 site is a historical and cultural exhibit. Eight of these are located in the watershed. These consist of 6 schools having combinations of baseball, football, basketball, tennis, and volleyball facilities; a livery of about 12 boats on Lake Dean; and 2 boat ramps on Tensas River.

Public access to outdoor recreational facilities is available, but use is moderate. The road leading to the boat livery on Lake Dean is a graveled, all-weather road. Four public boat launching ramps are available--two on the Tensas River, one on Bayou Macon "cutoff No. 1," and one on Bayou Macon "cutoff No. 3." One ramp on the Tensas River is near the confluence of Channel M-20, and the other is at the Louisiana Highway 4 crossing. The ramp near the confluence of Channel M-20 is constructed of concrete, but the access road is unimproved and almost impassable when wet. The ramp at the Highway 4 crossing is a gravel ramp that does not provide all-weather access.

## Archaeological, Historical Values, and Unique Scenic Areas

Local inquiries and investigations revealed no unique scenic areas. Before survey began, the Curator of Anthropology at Louisiana State University had records pertaining to 26 archaeological sites in the watershed. Only 10 of the sites have been classified. These are the remains of 3 villages; 4 mounds; 3 villages with associated mounds. Neither the National Register of Historical Places, the Curator of Anthropology, nor the Louisiana Historic Preservation and Cultural Commission identified places of historical importance in or near the watershed areas.

An archaeological survey was conducted by Northeast Louisiana University to locate prehistoric and historical remains along specified drainage channels within the East Franklin Watershed. Standard archaeological survey techniques were employed and the sites were recorded in the trinomial system used by most archaeologists in the United States. Specific locations of sites are not included in the text but the information is on file in the Geosciences Department of Northeast Louisiana University and with the Soil Conservation Service in Alexandria, Louisiana.

Survey efforts were hampered by dense vegetation and deep alluvial deposits. In some areas, archaeological remains will be exposed only if overburden is removed.

A total of 34 sites were encountered by the survey team along or near areas of proposed works. Of these, 10 are situated in Catahoula Parish and 24 are in Franklin Parish.

Soil, Water and Plant Management Status

Soybeans became a popular crop in the watershed about 1962. Planted acres have increased from about 10,000 acres in 1962 to approximately 77,000 acres in 1971. This increase has caused a reduction in forest land and pasture. Since 1958, approximately 37,000 acres of forest land have been cleared. The remaining 36,900 acres of forest land, with the exceptions of a 10,000-acre tract and two 1,000-acre tracts, are privately-owned farm wood lots of less than 200 acres. The bottom land hardwood area in north Louisiana is comprised of about 5,627,000 acres. In 1969, land clearing operations had reduced the acreage in bottom land hardwoods to about 2,522,000 acres. Bottom land hardwoods were removed at a rate of 111,235 acres per year between 1962 and 1968.26/

Soil and water conservation plans have been prepared for 225 farms covering about 54,000 acres. Approximately 90,500 additional acres, representing 440 farms, have received assistance from the District. An estimated 23 percent of the needed conservation measures have been applied. Land treatment has been applied to problem areas as well as nonproblem areas. During the last 10 years, landowners have applied measures costing approximately $1,389,200. Much of this was applied in water problem areas.

The Northeast Soil and Water Conservation District and the Franklin Parish Chamber of Commerce are involved in a public program titled "Let's Improve Franklin's Environment" (LIFE). The objectives of this community program are (1) develop and use resources, (2) make people aware of problems, (3) seek solutions, and (4) enjoy the benefits of a clean, bountiful environment.

Problem areas have been identified and action committees created. Committees have been created for (1) erosion control, (2) waste disposal, (3) roadway cleanup, (4) private property appearance, (5) building and housing improvement, (6) recreation and wildlife area improvement, (7) old car disposal, (8) beautification, (9) youth education, (10) drainage and flood prevention, (11) air and noise control, and (12) public relations.

Accomplishments of these committees include (1) removal of over 100 old car bodies, (2) establishment of planters in the town of Winnsboro, (3) sponsoring LIFE Essay and Poster Contest in public schools resulting in about 400 essays and 900 posters, (4) sponsoring parades in three towns as a kick-off for LIFE DAY, and (5) distribution of about 3,000 LIFE bumper stickers and 15,000 LIFE brochures. Some

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26/ Richard K. Yancey, The Vanishing Delta Hardwoods and Their Wildlife Resources, (A paper presented at the Governor's Seminar on the Mississippi Delta Hardwoods, Little Rock, Arkansas, 1969), p. 4.

planned activities include (1) another LIFE DAY with parades in three of the parish's towns, (2) removal of more old car bodies, (3) planting crepe myrtles along highways for beautification, and (4) support of a 2-mill tax for establishment of a solid waste disposal system.

Both soil and water conservation districts are actively involved in promoting conservation. Through the use of a monthly newsletter, radio and television announcements and programs, and newspaper articles, the Districts announce important activities and publicize results. Examples of recent activities are (1) participating in the Goodyear Soil Conservation Awards program, (2) participating in the Soil Stewardship Week observance, (3) attending the Louisiana Banker-Farmer Conservation Tour, (4) assisting Future Farmers of America to prepare for the soil judging contest, (5) attending a field day on minimum tillage, and (6) continuing to sponsor and work with the Boy Scouts in establishing a Conservation Resource Education Project.

The districts work closely with the district conservationists of the Soil Conservation Service in establishing priorities of work. As sponsors of this watershed project, the districts are actively involved in planning at several levels.

The Louisiana Forestry Commission, in cooperation with the U.S. Forest Service through the various Federal-State cooperative forestry programs, is providing forest management assistance, forest fire prevention and suppression, distribution of planting stock and forest pest control assistance to private landowners. There are no lands administered by the U.S. Forest Service within the watershed.

## Land and Water Management

The soils in the bottom land have low erosion rates when undisturbed. However, if they are disturbed and left bare during periods of high rainfall, they are erodible. The soils in the loessial terrace are highly erodible. The sloping loessial soils erode more easily and need more protection by conservation measures than those nearly level. Presently, there are 1,200 acres being cultivated on slopes greater than 5 percent that need conservation measures to reduce erosion.

Because of the generally flat terrain, high rainfall, and very slowly permeable soils (in the bottom land), a severe wetness problem exists on the cropland and pastureland. Many of these lands have adequate on-farm drainage systems, but lack sufficient outlets for these systems. Because of the undulating conditions in some areas and insufficient outlets, the on-farm drainage systems do not function properly. On the gently undulating areas, conservation measures such as land smoothing and drainage land grading are necessary to assure the benefits of the existing and needed drainage systems.

## Floodwater Damage and Drainage Problems

Flooding and drainage problems in flatland portions are related and inseparable. For this reason, the discussion of problems in these two categories is combined.

About 17,000 acres in the loessial terrace do not sustain damages from floodwater and inadequate drainage. However, runoff from these small noncontiguous areas contributes to the water problem of other areas.

About 60 percent of the 52 inches of average annual rainfall occurs during the winter and spring months, and about 40 percent occurs during the summer and fall months. Damaging, out-of-bank flows occur in the flatland portions of the watershed about four times a year on the average. For the 48-hour duration storm, a rainfall of 3.4 inches could be expected twice a year, 6 inches once in 3 years, and 9.4 inches once in 25 years. Although damages from the small, frequent storms are meager compared to damages from the large, less frequent storms, the aggregate damages from the small storms over a period of years are greater.

Some areas of the watershed are subject to backwater flooding. In the loessial terrace soils, these areas are located along the lower end of Deer Creek (Channel M-1). In the bottom land soils, these areas are located adjacent to Tensas River. In 1973, an estimated 24,000 acres of cropland and pastureland experienced backwater flooding

from conditions which are expected to occur once in 25 years. The backwater usually recedes in time for late crops such as soybeans or grain sorghum to be planted and harvested. Almost all the cropland and pastureland in this area is in Capability Class IIIw.

One of the problems of the low-lying land is inadequate major drainage outlets. Inadequate outlets are causing increased costs of production, increased levels of risk, reduced efficiency of farm equipment, and reduced quality and quantity of harvested crops. Local organizations, in cooperation with the Louisiana Department of Public Works, have reduced the problems of inadequate outlets; but funds have not been available to provide adequate systems for all areas. Some landowners and operators have installed on-farm and group drainage systems with the help of the Northeast and the Catahoula Soil and Water Conservation Districts, but the complete system of outlets for these smaller systems cannot dispose of the excess water properly.

The drainage area that is served by an estimated 238 miles of channels has been identified by the Sponsors as areas with inadequate drainage and flood problems. The channels are classified according to the type of channel and flow condition. The classifications are as follows:

| Type of Channel | | Miles |
|---|---|---|
| Well-defined natural channel | | 54 |
| Previously-modified or manmade channel | | 178 |
| Nonexisting or nondefined channel | | 6 |
| | Total | 238 |

| Flow Characteristics | | |
|---|---|---|
| Ephemeral | | 209 |
| Intermittent | | 22 |
| Ponded water | | 7 |
| | Total | 238 |

Soybean lands best illustrate the severity of the flooding and wetness problems since they represent the largest acreages and the soybean crops suffer the most damages. Rainfall is highest in winter and spring and lowest in late summer and early fall. Relatively little land preparation can be accomplished in early spring because large portions of the land are wet. When the better-drained portions of some fields are ready to plow, the poorly-drained portions are too wet. Work can be done on only the dry portions, but often, this is not economical. If the wet portions are plowed, soil may clod or the machinery might stall in the mud, which causes extra expenditures of time and money and excessive wear and tear on the

Low soybean plant populations in wet areas are typical.

Water standing on cultivated land because the outlets for on-farm drainage systems are inadequate.

machinery. If the entire field is plowed with some portions wet, reworking may be necessary to put the field in good tilth.

If adequate plant populations are established in early spring, water damage to the crop from late spring rains may occur, causing replanting or loss of the crop. Consequently, much planting is delayed until late June or early July. Since June is a dry month, a good plant population is difficult to establish because a dry soil hinders seed germination.

Since the root systems of late soybeans (soybeans planted late) are not developed as extensively as that of early soybeans (soybeans planted early), their growth is limited more by moisture deficiencies during the dry months of August, September, and October. Usually, late soybeans are not ready for harvest until November or December when the average rainfall exceeds the average rainfall for September and October by 20 percent. (September and October would be the normal harvest season for early soybeans.) Thus, much of the late soybean harvest is delayed or performed under highly unfavorable conditions.

When wetness causes delays in harvesting, soybeans often mildew in the pod and retain more moisture than is desirable. The longer harvest is delayed, the greater the loss from pods shattering. When the ground is wet, the cutter bar of the harvester cannot be maintained at the proper level because the machine sinks and bogs. Consequently, soybeans that would have been harvested are lost in the field. On wet land, harvested beans have to be hauled to the truck from the field by tractor and grain cart because the combine cannot empty directly into the truck. Overall, harvesting under adverse wet conditions is more costly and more time consuming.

A research report entitled The Effects of Production Practices on Soybean Yields, Costs and Returns in the Mississippi River Delta of Louisiana, published by the Department of Agriculture Economics and Agribusiness of Louisiana State University, describes the problem in more quantified terms. One of the key points made in this study is that there seemed to be a direct relationship between yields per acre and planting dates, soil types, surface and subsurface drainage, and land forming. Low-yield producers had less favorable soil types, poor drainage, and fewer land forming practices, and they planted a greater percentage of soybeans at a later date than did high-yield producers. The tabulation on the following page is a summary of production practices considered in the study.

Several important implications from the summary of the study are as follows:

(1) that the number of acres of soybeans produced was not a factor limiting the yield of soybeans for any group;

A Percentage Comparison of Production Practices for Soybeans by Yield Groups, Mississippi River Delta Area, Louisiana, 1970

| Item | Unit | Yield Group | | |
|---|---|---|---|---|
| | | Low | Medium | High |
| Average number of acres planted | acres | 597.4 | 815.4 | 636.6 |
| Heavy soil type | percent | 78.1 | 70.2 | 50.5 |
| Very good surface drainage | percent | 6.7 | 9.6 | 25.7 |
| Very good subsurface drainage | percent | 0 | 4.8 | 3.7 |
| Land forming practices | percent | 7.6 | 15.4 | 29.3 |
| Liming | percent | 12.4 | 34.6 | 22.9 |
| Fall plowing | percent | 72.4 | 73.1 | 91.8 |
| Deep tillage | percent | 48.6 | 55.8 | 64.2 |
| Planting on a bed | percent | 38.1 | 51.0 | 50.5 |
| Planting on 40-inch rows | percent | 50.5 | 37.5 | 57.8 |
| Completed planting by May 31 | percent | 59.4 | 86.5 | 85.3 |
| Double-disc opener planter | percent | 51.4 | 38.5 | 46.8 |
| Sword-type planter | percent | 48.6 | 61.5 | 53.2 |
| Use of pre-emergence herbicides | percent | 74.3 | 81.7 | 80.7 |
| Four cultivations | percent | 27.6 | 41.3 | 31.2 |
| Use of post-emergence herbicides | percent | 40.0 | 43.3 | 41.3 |
| Hand hoeing | percent | 32.4 | 50.0 | 57.8 |
| Flame cultivation | percent | 3.8 | 7.7 | 4.6 |
| Use of lay-by herbicides | percent | 10.5 | 13.5 | 5.5 |
| Complete weed control program | percent | 9.5 | 17.3 | 21.1 |
| Fields free of weeds | percent | 25.7 | 37.5 | 59.6 |
| Use of insecticides | percent | 33.3 | 39.4 | 22.0 |
| Average or better weather conditions | percent | 10.5 | 37.2 | 53.2 |

(2) that low-yield producers can increase average yields and returns through increased crop rotation programs, primarily by helping control weed infestation;

(3) that low-yield producers can increase yields and returns through more intensive drainage and land forming practices;

(4) that low-yield producers with careful variety selection based on soil type, date of planting, maturity dates, and specific soil physical characteristics can increase yields and incomes;

(5) that low-yield producers can generally increase yields by planting approximately 1 bushel of certified, high quality seed per acre before May 31, and that early maturing varieties (Hill, Dare, and Hood) suffer more from later planting dates than medium and late maturing varieties (Davis, Bragg, Lee, and Lee 68);

(6) that low-yield producers can increase yields and returns by a more complete weed control program (both chemical and conventional) where weed and grass infestation is a problem: and,

(7) that low-yield producers using four-row equipment can lower costs of production by using six-row equipment if they have at least 600 to 800 acres and if the age of present four-row equipment, timeliness of operation, labor availability, et cetera, would warrant the change.

Other crops are affected in a similar manner, although not as adversely. Pasture is affected; growth of grasses is slowed and the grass is unpalatable. Water tolerant weeds are difficult to eradicate. Stocking rates are not kept at full potential because grazing days are lost. Extra expenses are incurred in either moving the cattle or hauling hay and feed to them.

Roads require additional maintenance because of flooding. Extra gravel, fill materials, equipment, time, and labor are needed to keep roads open and passable. When roads are flooded, sections of schoolbus routes have to be omitted. Children then either miss school or have to be transported to the nonflooded roads by other means.

Indirect damages associated with flooding include any losses from flooding not directly related to it. Examples are traffic detours and extra expenses incurred as a result of delays in obtaining feed and other farm supplies. Also, market losses to farm products can be attributed to delays in transportation as a result of flooding.

Total average annual inseparable damages attributed to floodwater and impaired drainage amount to $1,047,200. Of this amount, $387,400 was allocated to drainage and $659,800 was allocated to flood prevention.

In addition, average annual road damages are $51,600 and indirect floodwater damages are $66,800.

## Erosion Damage

Sheet erosion, the dislocation of soil particles by the impact of raindrops and their removal by runoff, is the main cause of soil loss. The rate of sheet erosion is dependent on the following factors:

1. amount and intensity of rainfall

2. the cover or protection from raindrop impact

3. the physical character of the soil

4. the percent slope of the land and the uninterrupted length of the slope

Within the watershed, two of the above factors do not vary. The average amount and intensity of rainfall are similar and the vegetative cover within land uses is the same.

Variations in soils and slopes exist within the watershed. Two types of deposition account for the differences in soil materials found in the watershed: (1) loess and loess-derived soils of the upland, and (2) alluvium of the bottom land. The loess-derived soils are dominated by silt-sized particles and are more susceptible to erosion than soils of the bottom land which are dominated by clay-sized particles. The soils in the Southern Mississippi Valley Silty Upland Land Resource Area are derived from loess, with average slopes ranging from 1 to 1.5 percent. The bottom land soils in the Southern Mississippi Valley Alluvium Land Resource Area are primarily clays, with an average slope of approximately 0.5 percent.

Sheet erosion removes 866,750 tons of material each year within the watershed, an average of 4.4 tons per acre. Monetary damages from sheet erosion are low. The photographs on page 55 illustrate the susceptibility of the soils to sheet erosion.

While soil losses from gully, streambank, and roadside erosion occur, they are in scattered locales and are insignificant when compared to the soil losses from sheet erosion.

## Sediment Damage

Two general types of agricultural damage due to sediment occur: (1) sediment deposited at the lower ends of fields as a normal function of sheet erosion, and (2) sediment dropped from floodwater on agricultural land. The first type is illustrated by the lower photograph on page 55.

Inadequate crop residue permits excessive sheet erosion.

The light area along the tree line is sediment from sheet erosion
caused by heavy rains before the winter cover crop could be established.

Monetary values are not normally ascribed to this type damage since the reduction of this damage is a land treatment benefit. Sediment deposited from floodwater is illustrated by the photograph on page 57. Due to the scattered occurrence, limited amounts, fine texture, and fertility of this sediment, the damages from this type of deposition were grouped with the other floodwater damages and no monetary values were assigned.

Other types of sediment damage occur in the channels. One of the more common problems is sediment accumulation in channels as shown in the photograph on page 58 . These deposits create areas where willows will grow, causing a reduction in the channel capacity. Channel deposition of this nature is frequently the result of improper protection where water enters the channel from the side. Removal of the sediment is necessary for the channel to regain its capacity. These conditions increase the cost of operation and maintenance for the system.

At the present time, the average annual sediment delivered to Boeuf River, Bayou Macon, Tensas River, and other locations on the watershed boundary amounts to approximately 305,000 tons. The following tabulation shows this:

Annual Sediment
East Franklin Watershed

| | Sediment Delivered To | |
|---|---|---|
| Major Outlet | | Other Locations |
| | --------tons per year | ---------------- |
| Boeuf River | 67,250 | 14,000 |
| Bayou Macon | 162,350 | -- |
| Tensas River | 61,200 | -- |
| Total | 290,800 | 14,000 |

The computed average annual sediment yield concentration amounts to 687 mg/l. This figure includes the collodial sediment and the mud flow at the bottom of the channels. The computations are based on the total average amount of sediment being delivered and on the runoff from the watershed. Analyses were made on two water samples taken from the lower portion of Deer Creek and Bayou Macon "cutoff No. 2." Those data showed suspended sediment concentrations of 310 mg/l in Deer Creek and 19 mg/l in Bayou Macon "cutoff No. 2." Suspended sediment concentrations will show wide variations due to the following factors:

Sediment deposited on fescue pasture along Channel M-2. This type of sediment damage is local in extent and usually minor.

Sediment deposit in Channel M-2. This deposition is very recent. Woody growth will start soon on this deposit and severely restrict the flow-carrying capacity of the channel.

PROBLEMS

1. season of the year

2. antecedent moisture

3. duration and intensity of the last rain

4. the portion of a storm hydrograph which was sampled

Irrigation

The interest in project-type irrigational development is low. Although the acreage of irrigated land in Franklin Parish has been increasing, it is still relatively small. The following Census of Agriculture data exemplifies this situation:

| Item | Unit | Years 1959 | 1964 | 1969 |
|---|---|---|---|---|
| Irrigated Land in Farms | acres | 1,253 | 4,250 | 7,134 |
| Number of Farms | number | 38 | 86 | 99 |
| Average per Farm | acres | 33 | 49 | 72 |

The 7,134 acres irrigated in 1969 represent about 3 percent of the total cropland in Franklin Parish.

The only crop which requires regular irrigation is rice, whose main source of water is a shallow, manmade reservoir of about 200 acres. The other crop irrigated is cotton. The major source of this water is wells. Cotton is irrigated on an irregular basis since its water requirements are not high. Irrigation of cotton has been accepted slowly although experiments conducted in the parish at the Macon Ridge Branch Experiment Station indicates that it is profitable.

An average of about 2.5 inches of rainfall per month occurs during the droughty months. The time that this rainfall will occur is uncertain. This uncertainty is best exemplified by excerpts from an experiment station bulletin which gives results of an experiment conducted from 1958 to 1962 as follows:

Data for 1959 - "Although irrigation did increase yields by 305 pounds of seed cotton per acre, the difference was not significant. .....2 inches of irrigation water was applied to the designated plots on July 9. After application of the water,

0.8 inch of rain fell, possibly eliminating some benefits of the irrigation."1/

Data for 1961 - "Ample rainfall in 1961 made it unnecessary to water plots that were to have been irrigated."2/

The cost of installing an irrigational system is a major investment many farmers are unwilling to make when they consider the irregularity of its use.

The primary source of ground water is from Quaternary Alluvial Deposits. Wells drawing water from this source have a potential for yields up to 6,500 gallons per minute. The water is suited for irrigation. A ridge of high chloride content water lying immediately west of the watershed may have influence in some wells along the western border. In Franklin Parish in 1969, 5.62 million gallons per day were pumped for irrigation from the alluvial aquifer. Irrigation development on individual farms is expected to expand in the future. Supplies of ground water are adequate in both quantity and quality. Water for future irrigation is expected to come mostly from ground sources.

Municipal and Industrial Water

Three towns in Franklin Parish obtain water from the valley alluvium of Pleistocene age. These are Gilbert (population 600), Winnsboro (population 4,250), and Wisner (population 1,300). Gilbert and Wisner are within the watershed. Pumpage from two wells in Gilbert averages approximately 35,000 gallons per day. Pumpage from two wells in Wisner average approximately 96,000 gallons per day. The quality of the water from these wells is acceptable. The water at Gilbert contains 100 ppm chloride. This is above the desirable level, but within the acceptable level of water quality for public consumption. This level of chloride is probably a result of the presence of a salt dome in the vicinity or the previously-mentioned saltwater ridge. There are no anticipated increases on the demand for water in these towns, and the present systems should be adequate.

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1/ Sherman A. Phillips, Cotton Irrigation Studies, Bulletin No. 579, (Baton Rouge: Louisiana State University and Agricultural and Mechanical College, Agriculture Experiment Station, 1964) pp. 8-9.

2/ Ibid., p. 13.

PROBLEMS

Recreation

The 1970 population with a 30-mile radius of the center of the watershed was estimated to be 86,000. This area includes 17 villages and towns, only two of which are considered urban. Population projections3/ to the year 1990 indicate a decrease in the number of people in a portion of the 30-mile radius area containing 85 percent of the present population. The main reason for this projected population decrease is the past and present migration of rural residents to urban areas.

The watershed is below average in facilities available for water-related recreational activities. Turkey Creek Lake, Lake Bruin, Lake St. Joseph, and Lake St. John, all within the 30-mile radius of the watershed, provide water-related recreational opportunities, but facilities are limited. Several streams and rivers are near the area. The best known ones are the Mississippi, Tensas, Ouachita, and Boeuf Rivers; Bayous Macon, Lafourches, and Vidal; and Big and Deer Creeks. The recreational potential of these waterways has not been developed fully.

Public recreational areas within the 30-mile radius study area are Lake Bruin State Park (45 acres) and Russell Sage Wildlife Management Area (14,600 acres).

A sample of recreational needs based on the present population within the 30-mile radius includes 468 tent camping sites, 216 trailer sites, 518 picnic sites, 66 boat ramps, and 3 beaches and swimming areas of standard size.4/

There is a need for additional recreational facilities in the watershed, and local interest exists for developing these facilities. However, investigations indicate little opportunity for developing water-related recreational facilities because water storage sites are severely limited by the flatness of the terrain.

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3/ George C. Christon and Harris S. Segal, Population Projections to 1980 and 1990 for Louisiana and Its Parishes, Research Study No. 18, (New Orleans: Division of Business and Economic Research, College of Business Administration, University of New Orleans, 1973), pp. 21-22.

4/ Louisiana State Parks and Recreation Commission, State of Louisiana, Comprehensive Outdoor Recreation Plan, 1970-75 (Baton Rouge: Louisiana State Parks and Recreation Commission, 1969), pp. 2.6-2.7.

PROBLEMS

## Plant and Animal Resource Problems

Changed land use has adversely affected fish and wildlife resources more than any other factors. In the past 15 years, 37,300 acres of bottom land hardwoods have been cleared. The majority of this acreage has gone into soybean production. The reduction in forested habitat resulted in losses of white-tailed deer, gray and fox squirrels, swamp rabbits, wild turkeys, and many nongame species.

The remaining 36,900 acres of forest land are of prime importance as wildlife habitat. The 10,000-acre block in the east-central portion of the project area has exceptionally high value because of its location, size, quality of habitat, and ownership pattern. As previously mentioned, clearing of bottom land hardwood has seriously depleted wildlife habitat, and unless this tract can be developed as a wildlife management area, it may eventually be cleared.

Although large acreages of open land habitat are available, use of the habitat is low because cover is inadequate. When the soybeans are harvested, many beans and weed seed are shattered and left for wildlife food. However, the remaining cover is so sparse that game species such as quail will not feed in these fields. Also, cover along fences and ditches is too sparse for quail or rabbits to use as travel lanes or headquarters areas. Game species using open land habitat are the bobwhite quail, mourning dove, and cottontail rabbit.

Public access to some of the forested areas is limited. Without four-wheel drive or all-terrain vehicles, the unimproved roads are impassable during wet periods. Legal posting of private land also limits public access.

The conversion of forest land to open land has increased sediment in aquatic ecosystems. Pesticides and nutrients (N, P, K) are reaching downstream areas in greater quantities than when the acreage was forested. Eutrophication in Boeuf River, Tensas River, and Bayou Macon has accelerated as a result of the increased use of fertilizers.

Turbid water is another problem limiting the fisheries in ponded water channels, intermittent channels, and the three outlets. This problem is a result of the erosion of fine-textured soils on intensively-farmed drainage areas.

Use of chlorinated hydrocarbons as pesticides is a problem. Chlorinated hydrocarbons persist in aquatic ecosystems for long

periods of time. Epps, et al., 5/ reported channel catfish taken from the Tensas River near Clayton (12 miles south of the project) containing 6.28 ppm of DDT and metabolites. Toxaphene levels in channel catfish were reported to be 5.05 ppm. The upper tolerance limits for DDT and metabolites are 5 ppm. No tolerance limits have been established for toxaphene, but the suggested guidelines are 5 ppm for the edible parts.6/

## Water Quality Problems

Sediment and sedimentation are the major water quality problems. Excessive turbidities in some channels (Deer Creek, 160 ppm) and the outlets (Bayou Macon, 200 ppm) during some months is a problem.

Sediment and sedimentation have many adverse effects on aquatic ecosystems. Sediment fills lakes and streams, lowers the aesthetic value of the water, and carries pesticides and macro-plant nutrients into aquatic environments. For more information on the effects of sediment on water quality see the discussion in appendix D under Turbidity, Suspended Solids, and Temperature.

Eutrophication is not a major problem at present, but it has a high potential of becoming a problem. Nutrients, primarily phosphorous and nitrogen, cause aquatic enrichment and come from two sources--from point sources and diffuse sources. There are no known major contributors to point source pollution in the watershed. However, isolated pollution sources are present but do not contribute significantly to downstream water quality. Point sources are locations where nutrients enter the water from specific, concentrated locations. Diffuse sources include agricultural runoff, septic tank effluents, wetland drainage, and recycling of nutrients from botton sediments. This source has the highest potential of becoming a problem in the area. Sixty to seventy percent of the nitrogen in natural lake waters comes from diffuse sources.7/ Nitrate nitrogen varied from .06 ppm at

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5/ E.A. Epps et al., "Preliminary Report on a Pesticide Monitoring Study in Louisiana, "Bulletin of Environmental Contamination and Toxicology, Volume 2, No. 6 (New York: Springer Verlog, Inc., 1967) pp. 333-339.

6/ Five ppm were suggested as guidelines for toxaphene by the Federal Drug Administration in a letter to Dr. John Impson, Assistant Specialist for Pesticide Safety, Louisiana Cooperative Extension Service, Louisiana State University, Baton Rouge, Louisiana.

7/ Herbert E. Allen and James R. Kramer, Nutrients in Natural Waters (New York: John Wiley and Sons, Inc., 1972), p. 440.

Bayou Macon "cutoff No. 3" sampling station to .13 ppm at the Deer Creek sampling station in this project area. Diffuse sources are more difficult to locate and treat than point sources. For more information on water quality, see the tabulation on the following page and the data in the ENVIRONMENTAL SETTING and appendix D.

## Economic and Social Problems

The level of income necessary for surviving on a minimum diet with none of the amenities of prosperity has been determined by the Social Security Administration.8/ By their definition, an individual is considered poor if his personal income or the income of the family to which he belongs inadequately provides for his subsistence. In 1960, 58 percent of all the families in Franklin Parish were classified as poor. In 1966, 44 percent were classified as poor. This represents an improvement of approximately 13 percent in 6 years. However, 96 percent of all the counties in the United States had a smaller proportion of poor families. About 0.7 percent of the families in the State of Louisiana live in Franklin Parish. However, 0.9 percent of all the poor families in the State reside in this parish. Therefore, it has a greater than proportionate share of poor families. In 1969, the buying income of households in the parish was 38 percent below the average for the State.

According to the 1970 census for Franklin Parish, there were 5,684 families with a median income of $4,171. Of the total families, 1,277 were urban with a median income of $5,840, 2,753 were rural nonfarm with a median income of $4,204, and 1,654 were rural farm with a median income of $3,286. Only 29 percent of the urban families had incomes less than the poverty level while approximately 45 percent of both the rural nonfarm and rural farm had incomes less than the poverty level. Since the watershed population is all rural, about 45 percent of families residing in it are below the poverty level.

Estimates based on the 1969 Census of Agriculture indicate 32 percent of the 820 farms in the watershed were below 50 acres, and 22 percent were between 50 and 100 acres. This indicates over 50 percent of the farms were below 100 acres in size. Thirty-nine percent of the farms had sales less than $2,500, 24 percent had sales between $2,500 and $5,000, and 16 percent had sales between

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8/ James R. Robo and Dean R. Dudley, Statistical Abstract of Louisiana, 4th ed. (New Orleans: Division of Business and Economic Research, College of Business Administration, Louisiana State University in New Orleans, 1971), p. 172.

WATER QUALITY DATA FROM MONITORING PROGRAM

East Franklin Watershed

| PARAMETERS | Date | Deer Creek | Bayou Macon Cutoff No. 1 | Bayou Macon Cutoff No. 2 | Bayou Macon Cutoff No. 3 | Average of Stations |
|---|---|---|---|---|---|---|
| Color (Units) | 9/27/73 | 430 | a/ | a/ | 100 | 265 |
| | 2/12/74 | 80 | 205 | 185 | 210 | 170 |
| | 3/19/74 | 230 | 110 | 225 | 180 | 186 |
| Average | | 247 | 158 | 205 | 163 | 207 |
| Hardness (ppm) | 9/27/73 | a/ | a/ | a/ | a/ | a/ |
| ($CaCO_3$) | 2/12/74 | 20 | 30 | 20 | 20 | 23 |
| | 3/19/74 | 32 | 28 | 24 | 22 | 27 |
| Average | | 26 | 29 | 22 | 21 | 25 |
| Nitrogen (ppm) | 9/27/73 | 0.30 | a/ | a/ | 0.0 | 0.15 |
| Ammonia | 2/12/74 | 0 | 0.0 | 0.0 | .28 | .07 |
| (N) | 3/19/74 | 0 | 0 | 0 | .31 | .08 |
| Average | | .10 | 0 | 0 | .30 | .10 |
| Nitrogen (ppm) | 9/27/73 | 0.32 | a/ | 0.10 | 0.06 | 0.12 |
| Nitrate | 2/12/74 | .02 | 0.15 | .04 | .11 | .08 |
| (N) | 3/19/74 | .04 | .05 | .05 | .22 | .09 |
| Average | | .13 | .10 | .06 | .13 | .10 |
| Oxygen (ppm) | 9/27/73 | 4.0 | a/ | 8.0 | 4.0 | 5.3 |
| | 2/12/74 | 11.0 | 10.0 | 11.0 | 7.0 | 9.8 |
| | 3/19/74 | 8.0 | 11.0 | 10.0 | 6.0 | 8.8 |
| Average | | 7.6 | 10.5 | 9.6 | 5.6 | 8.0 |
| pH (Units) | 9/27/73 | 6.7 | a/ | 7.5 | 6.5 | 6.9 |
| | 2/12/74 | 7.2 | 7.0 | 7.0 | 6.5 | 6.9 |
| | 3/19/74 | 7.0 | 8.0 | 7.0 | 6.5 | 7.1 |
| Average | | 7.0 | 7.5 | 7.2 | 6.5 | 7.0 |
| Phosphate (ppm) | 9/27/73 | 0.48 | a/ | 0.12 | 0.35 | 0.32 |
| Ortho | 2/12/74 | .27 | 0.38 | .42 | .62 | .42 |
| ($PO_4$) | 3/19/74 | .78 | .06 | .25 | .5 | .4 |
| Average | | .51 | .22 | .26 | .49 | .38 |
| Sulfate (ppm) | 9/27/73 | 13 | a/ | a/ | 0 | 6 |
| ($SO_4$) | 2/12/74 | 0 | 0 | 0 | 0 | 0 |
| | 3/19/74 | 0 | 10 | 0 | 5 | 4 |
| Average | | 4 | 5 | 0 | 2 | 3 |
| Sulfide (ppm) | 9/27/73 | 0.17 | a/ | a/ | 0.04 | 0.1 |
| (S) | 2/12/74 | .02 | 0.1 | 0.07 | .09 | .07 |
| | 3/19/74 | .07 | .05 | .1 | .05 | .07 |
| Average | | .09 | .08 | .09 | .09 | .08 |
| Suspended (ppm) | 9/27/73 | 85 | a/ | a/ | 25 | 55 |
| Solids | 2/12/74 | 7 | 16 | 22 | 20 | 16 |
| | 3/19/74 | 18 | 20 | 30 | 18 | 22 |
| Average | | 37 | 18 | 26 | 21 | 31 |
| Temperature | 9/27/73 | a/ | a/ | a/ | a/ | a/ |
| (°F) | 2/12/74 | 60 | 65 | 65 | 56 | 62 |
| | 3/19/74 | 66 | 72 | 70 | 68 | 69 |
| Average | | 63 | 68 | 68 | 62 | 65 |
| Turbidity (JTU) | 9/27/73 | 160 | a/ | a/ | 45 | 103 |
| | 2/12/74 | 35 | 80 | 70 | 80 | 66 |
| | 3/19/74 | 80 | 45 | 80 | 60 | 66 |
| Average | | 92 | 63 | 75 | 62 | 78 |

a/ Data not available

$5,000 and $10,000. This indicates about 80 percent of the farms had sales of less than $10,000. On an average, farmers have received $.24 net return for each dollar of gross sales.9/ For example, a farm with gross sales of $2,500 would have a net income of $600, and one with gross sales of $10,000 would have a net income of $2,400. Some farmers are able to augment their low farm income by finding employment off the farm.

About 10 percent of the farms use 1 1/2 man-years or more of hired labor. These farms are scattered throughout the watershed and are not confined to problem or nonproblem areas.

Old-age assistance and aid to dependent children are the two largest categories of welfare aid granted to recipients in Franklin Parish. Of the total welfare assistance grants made in fiscal year 1969, 63 percent was for old-age assistance, 25 percent was for aid to dependent children, 9 percent was for disability assistance, 2 percent was for general assistance, and 1 percent was for aid to the needy blind.10/

In 1970, 43 percent of the parish population was 18 years old or younger and 11 percent was 65 years old or older. Approximately 2,050 children, representing 20 percent of the population 18 years or younger, received aid.11/

The population of Franklin Parish decreased by 2,142 from 1960 to 1970. This was an 18.7-percent decrease in the expected 1970 population. The expected 1970 population was calculated by adding births from 1960 to 1970 to the 1960 population and then subtracting deaths which occurred during that same time period. The net out-migration totaled 5,520. Of the net out-migration, 77 percent were nonwhite and 23 percent were white.12/ Many young adults are leaving the rural areas to seek employment elsewhere. From 1960 to 1970, the number of rural males 20 to 45 years of age decreased 6.5 percent,

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9/ "Farm Suppliers, Mighty Link in the Marketing Chain," Farm Index (February 1974) p. 10.

10/ Robo, op. cit., p. 79.

11/ Ibid., p. 87.

12/ Fred M. Wrighton and Barbara H. Denton, "Net Migration in Louisiana," The Louisiana Economy (Ruston: College of Business Administration, Division of Business and Economic Research, Louisiana Tech University, 1971), Vol. V, No. 1, pp. 2-5.

and the number of rural males 55 years and older increased 13 percent.13/

Franklin Parish and Richland Parish are eligible for financial assistance under Title IV of the Public Works and Economic Development Act. Franklin Parish and Richland Parish have had unemployment at 6 percent or more of the work force.

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13/ Data to develop these statistics were obtained from the 1960 and 1970 Census of Population, Final Report PC (1) - A20 Louisiana.

# ENVIRONMENTAL IMPACTS

## Conservation Land Treatment

The installation of land treatment measures will improve soil cover and drainage. Installation of conservation cropping systems, crop residue management, structures for water control, pasture and hayland planting and management, and forestry management will reduce erosion.

Installation of practices such as drainage land grading and land smoothing for drainage and irrigation, and structures for water control will help alleviate the wetness problems and reduce erosion in the watershed. The effects of these land treatment practices and structural measures are inseparable and are discussed in the Structural Measures section.

Emphasis will be placed on the land treatment program and the forest management program. Proper management and protection of cropland will improve soil conditions by allowing better movement of air and water. Forest lands will be managed using the multiple-use concept.

An accelerated technical assistance program will provide assistance to develop management plans for 8,600 acres of forest land. Management plans will be directed toward resource management for forest products, wildlife habitat, and watershed protection. A forester will be assigned to the project to guide and assist landowners in installing the planned forestry measures.

Land treatment measures will also be applied to 1,200 acres of forest land. These measures will contribute to watershed protection by reducing storm runoff and sediment production from susceptible upland soils, and will enhance the future economy of the watershed. They will increase its wildlife carrying capacity for most species currently present. Some species, cotton mice for example, would be harmed. Periodic timber thinnings will open up the canopy allowing more sunlight to reach the forest floor. These thinnings stimulate browse production.

Land treatment measures will reduce erosion and the resulting sedimentation and turbidity will decrease. Sheet erosion over the project area will be reduced from 4.4 tons per acre per year to 4 tons per acre per year. This reduction in sheet erosion, as a result of land treatment measures, will result in a 9-percent reduction in sediment.

## Structural Measures

Flood Prevention and Drainage - Project measures will provide a 4-year level of protection to crops and pastures in the benefited areas. This means that the average time between significantly damaging storms will be more than 4 years. Average annual damages will be reduced about 78

percent. Peak stages will be increased in project channels and downstream from project channels. The increases in peak stages at selected points are shown in the following tabulation:

Stage Changes from Selected Storm
Frequencies at Key Stream Locations
East Franklin Watershed

| Stream Location | Peak Increase Stage 4-yr. | 10-yr | 100-yr |
|---|---|---|---|
| | - - - - - - - - | feet - - - - - | - - - - |
| Channel No. M-1, Station 0+00 | 0.2 | 0.2 | 0.1 |
| " " M-3, " 43+00 | 0.2 | 0.2 | 0.1 |
| " " M-4, " 147+00 | Less than | 0.1 | |
| " " M-9, " 95+00 | 0.1 | 0.1 | 0.1 |
| " " M-12, " 150+00 | .1 | .1 | .1 |
| " " M-14, " 25+00 | .1 | .1 | .1 |
| " " M-17, " 50+00 | .1 | .1 | .1 |
| " " M-21 " 121+00 | .2 | .1 | .1 |
| Ouachita R. Jct. Boeuf R. | 0 | 0 | 0 |
| Bayou Macon Jct M-12 | 0 | 0 | 0 |
| " " " M-9 | 0 | 0 | 0 |
| " " " M-4 | 0 | 0 | 0 |
| " " " M-3 | Less than | 0.1 | 0 |
| Roaring B. " M-14 | 0.1 | 0.1 | 0.1 |
| Tensas R. " M-16 | .2 | .1 | .1 |
| " " " M-21 | .2 | .1 | .1 |
| " " " B. Macon | .2 | .1 | .1 |
| Black R. " Tensas R. | 0 | 0 | 0 |

The tabulated changes in stages include the effects of all proposed and installed Public Law 566 projects in the drainage areas of the streams which will serve as watershed outlets.

The project will provide protection to agricultural land from the storm which is expected to occur on an average frequency of once every 4 years. The runoff from the 4-year frequency storm will not be contained wholly within channel banks, but it will be back within channel banks 24 hours after the storm ceases. Runoff from storms of a greater magnitude will inundate land for periods longer than 24 hours. However, the period of inundation would be much shorter than the period under present conditions, thereby reducing the probability of crop loss. Also, the flood hazard duration to roads would be reduced; vehicle traffic will be back to normal much sooner.

The area benefited by Channel L-1B is designated a limited use area. The maximum protection that can be provided is to short-season crops or those that can be planted and reach maturity during the period

June 1 through November 30. Still, some detrimental flooding will occur on the average of 2 out of every 5 years.

About 37,000 acres of forest land have been cleared in the last 15 years. The 10,000-acre block of bottom land forest is the only large area remaining that is subject to being cleared and converted to cropland. One project channel is located on the southwest and another on the northern edge of this large forested tract. One channel, M-16, enters the tract approximately 0.5 mile from the western edge of the forest land at Louisiana Highway 4 and extends 0.3 mile in a northwesterly direction then 0.5 mile in a westerly direction. The other channel, M-14, enters the tract approximately 1 mile west of the Franklin-Tensas Parish line and extends 1.5 miles through the forested tract along a gravel road. No other project channels are located internal to this large forested tract and the project would not change the present conditions. The better drainage on the land adjacent to this tract will improve the economic returns on the land presently being cropped. The soils are highly productive and returns on soybeans are about $35 per acre compared with $7 per acre for timber production and wildlife leases. Although these returns could provide some economic inducement to convert the forest land to cropland, the present flooding and drainage problems will remain and the economic risk of producing crops would remain unchanged. No clearing was assessed to the project since present conditions would not be changed and future land use conversions would be contingent upon floodwater removal and improved drainage conditions by other means.

Cotton and soybeans make up 24 and 66 percent, respectively, of the cropland. The other 10 percent is used for corn, grain sorghum, oats, rice, orchards, wheat, truck crops, and idle land. Floodwater and drainage effects are discussed together because the problems are inseparable. Channels which remove floodwater also remove drainage water.

In general, installation of the project will reduce the high risks involved in farming and make it a more profitable business enterprise. Farmers will be able to:

1. Improve soil conditions

2. Plant in early spring, thus getting more uniform, increased plant populations

3. Control weeds and grasses better

4. Harvest at favorable times

5. Produce better quality and higher yielding crops.

Improved drainage will allow better timing of cultural practices. Both planting and harvesting can be done more efficiently at opportune dates. Large equipment can be used on the more level, better-drained

fields; planting will be done early, thus increasing the chances for more uniform plant populations. Also, this will make available more days during critical crop growing periods of maximum utilization of equipment and other committed factors of production. Because wetness is reduced, the frequency of replanting will be reduced, and land treatment measures can be applied more effectively. This will promote crop residue management, reduce fall plowing, and permit better rotations of crops in the problem areas. In turn, these practices will conserve soil fertility, reduce erosion, and help control weedy growth.

Pasture grasses will grow faster and provide better, more desirable forage. Unpalatable, water tolerant weeds will not thrive as well under the better-drained conditions produced by project installation. As a result, stocking rates for livestock will increase and the pastureland will be used nearer its potential.

About 76,200 acres of cropland and pastureland will be benefited (see the benefited area on the Project Map, Appendix C.) Overall improved farming efficiency resulting from project installation will reduce the average annual fixed cost of production about $116,700; also, the reduced flooding, improved soil conditions, and better, more timely management practices will improve the quality of products marketed. The average annual increase in net returns due to improved crop quality amounts to about 6 percent or $57,000.

On the basis of the 4-year level of protection, the estimated average annual reduction of crop and pasture floodwater damages and loss of net returns due to impaired drainage amounts to $849,600. Of this amount, $462,200 was allocated to direct flood damage reduction benefits and the remaining $387,400 was allocated to the recovery of losses of net returns attributed to improved drainage. Average annual flood damages to roads will be reduced an estimated $40,500, and indirect project benefits will be an estimated $54,300. In addition, average annual benefits from more intensive use of land as a result of flood prevention and improved drainage would amount to approximately $94,400.

Erosion and Sediment - Erosion and the resulting sedimentation and turbidity will decrease with the installation of the planned project measures. Sheet erosion over the entire watershed will be reduced from 4.4 tons per acre per year to 4 tons per acre per year. This is a reduction of 9 percent.

Sediment being delivered to the Boeuf River, Tensas River, Bayou Macon, and minor streams will be reduced approximately 400,000 tons by project measures during the 10-year project installation period. Annual sediment being delivered to these points will be reduced 26 percent, from 301,000 tons to 224,000 tons. This reduction not only reflects the reduction in sheet erosion but also reflects the

trapping effect of the structures for water control (weirs) that will be installed. The graph and tabulation on the following pages will illustrate these reductions by evaluation units and areas.

Average annual concentrations of suspended sediment will be reduced from a calculated 687 mg/1 to 505 mg/1.

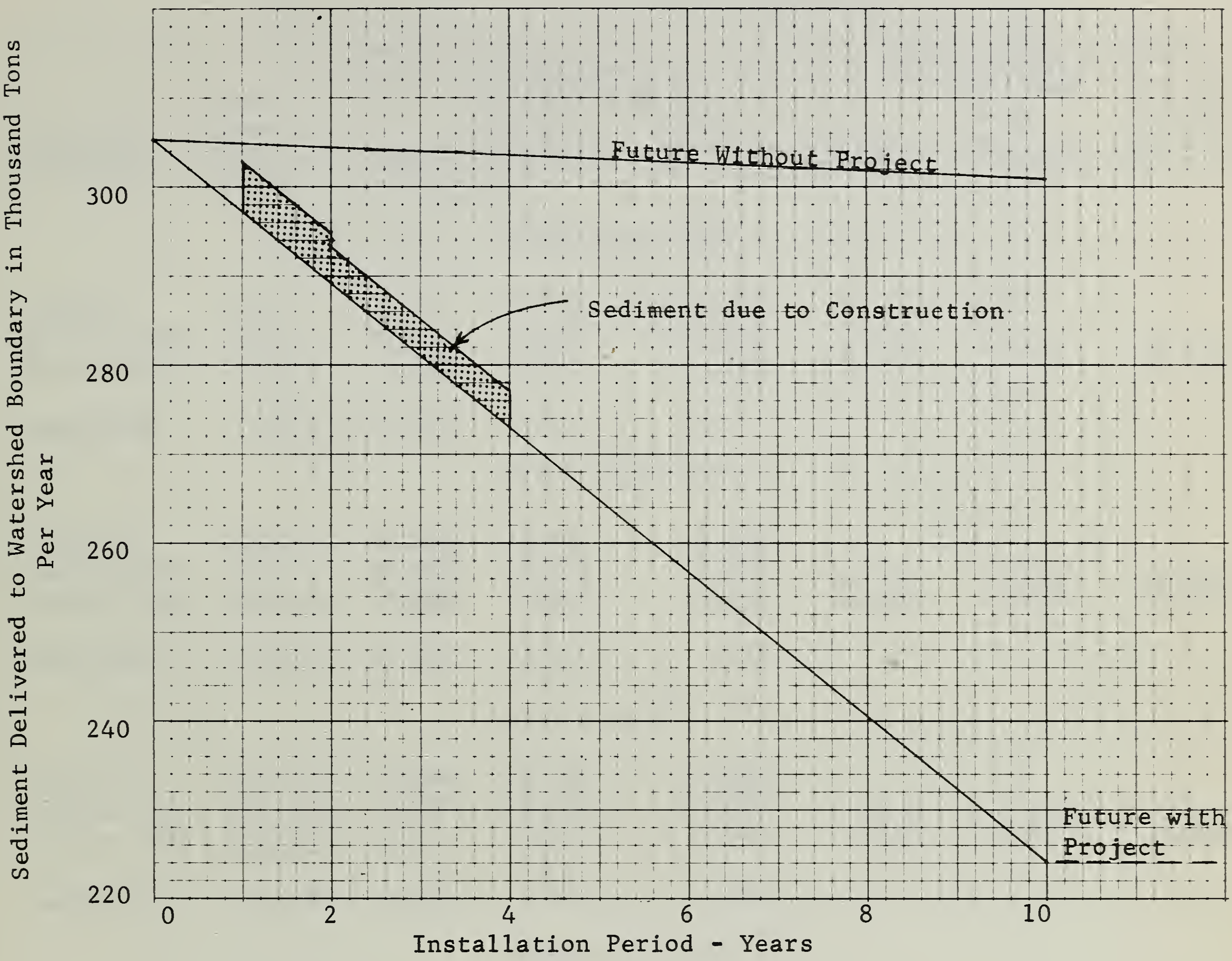
Several practices are planned which will reduce the amount of sediment delivered from channel construction. Vegetative plantings on the disturbed soil will be accomplished immediately after construction. Vegetative cover will be established within 90 days of construction. The photographs on page 75 illustrate the effectiveness of these practices. The structures for water control (weirs) will be constructed prior to the channel excavation. This will trap a large percent of any sediment produced during construction. It is estimated that an average of 5,000 tons of sediment per year for 3 years will be generated by construction. This sediment will be offset by the reductions that will be achieved by land treatment and structural measures. Photographs on page 76 illustrate land treatment practices that will be applied.

Other design features and construction methods have been instituted to reduce erosion and sedimentation from the channels. Channel design velocities will not cause erosion of materials to be encountered during construction. Channel side slope designs will assure stable banks. Usually, construction will disturb only one bank. Trees left on undisturbed banks and in channel rights-of-way will help to shade out undesirable growth inside the channel and reduce maintenance of vegetative control within the channel. Where possible, project channels will empty into undisturbed vegetated channels which will act as filters.

Fisheries - Twenty-eight structures for water control (weirs) will be installed resulting in 46 miles and 147 acres of permanent water. These structures will have a beneficial effect on the aquatic environment within the channels and downstream. Although the 147 acres of water will not be high quality fish habitat, they will support a standing crop of about 30 pounds per acre. The water in each pool will provide additional habitat for wading birds, amphibians, and reptiles. Game and nongame species will have additional watering sites. As a result of the shallow water, occasional growths of aquatic weeds may occur.

The 28 weirs totaling 147 acres of permanent water will have an average surface area of 5.2 acres, the average length will be 1.7 miles, and the average depth will be 1.5 feet. As a result of the shallow water at these sites, and the small size of the impoundments, they offer poor quality water-based recreation. Also, because of their location, they are not conveniently accessible to the general public. For these reasons, no recreation developments are anticipated along the banks.

EAST FRANKLIN WATERSHED
Sediment Delivered to Watershed Boundary




Reduction in Sediment Yield From the Watershed
During Installation Period
(tons)

| Year | Future Without Project | Future With Project | Reduction |
|---|---|---|---|
| 1 | 305,000 | 303,500 | 1,500 |
| 2 | 304,500 | 295,000 | 9,500 |
| 3 | 304,000 | 287,000 | 17,000 |
| 4 | 303,500 | 278,000 | 25,500 |
| 5 | 303,000 | 264,000 | 39,000 |
| 6 | 302,500 | 256,000 | 46,500 |
| 7 | 302,000 | 248,000 | 54,000 |
| 8 | 302,000 | 240,000 | 62,000 |
| 9 | 301,500 | 232,000 | 69,500 |
| 10 | 301,375 | 224,110 | 77,265 |
| Total | 3,029,375 | 2,627,610 | 401,765 |

Summary of Erosion and Sediment Data
East Franklin Watershed

| Watershed Condition | Total Sheet Erosion | Sediment Delivered by: Total | Sediment Delivered by: Project Channels | Sediment Delivered by: Other Channels | Construction: Erosion | Construction: Sediment From Erosion | Sheet Erosion Trapped By Weirs |
|---|---|---|---|---|---|---|---|
| | - - - - tons per year - - - - | | | | - - - - tons - - - - | | |
| **EVAULATION UNIT I** | | | | | | | |
| Present | 259,115 | 81,231 | 67,246 | 13,985 | - | - | - |
| Future W/O | 256,651 | 80,251 | 67,229 | 13,022 | - | - | - |
| Future With | 231,810 | 54,278 | 42,494 | 11,784 | 18,081 | 5,424 | 18,211 |
| Reduction | 27,305 | 26,953 | 14,752 | 2,201 | | | |
| **EVALUATION UNIT II** | | | | | | | |
| Present | 276,254 | 85,854 | 72,953 | 12,901 | - | - | - |
| Future W/O | 273,612 | 84,760 | 73,161 | 11,599 | - | - | - |
| Future With | 246,455 | 49,866 | 39,643 | 10,223 | 22,701 | 4,540 | 26,429 |
| Reduction | 29,799 | 35,988 | 33,310 | 2,678 | | | |
| **EVALUATION UNIT III** | | | | | | | |
| Present | 182,152 | 76,504 | 31,796 | 44,708 | - | - | - |
| Future W/O | 180,415 | 75,774 | 31,791 | 43,983 | - | - | - |
| Future With | 163,021 | 67,034 | 27,272 | 39,762 | 5,468 | 3,828 | 1,435 |
| Reduction | 19,131 | 9,470 | 4,524 | 4,946 | | | |
| **EVALUATION UNIT IV** | | | | | | | |
| Present | 149,227 | 61,183 | 26,570 | 34,613 | - | - | - |
| Future W/O | 147,781 | 60,590 | 26,429 | 34,161 | - | - | - |
| Future With | 134,384 | 52,932 | 21,884 | 31,048 | 2,107 | 1,306 | 2,165 |
| Reduction | 14,843 | 8,251 | 4,686 | 3,565 | | | |
| **TOTAL FOR WATERSHED** | | | | | | | |
| Present | 866,748 | 304,772 | 198,465 | 106,207 | | | |
| Future W/O | 858,459 | 301,375 | 198,610 | 102,765 | | | |
| Future With | 775,670 | 224,110 | 131,293 | 92,817 | 48,357 | 15,098 | 48,240 |
| Reduction | 91,078 | 80,662 | 57,272 | 13,390 | | | |
| % Reduction | 10.5% | 26.5% | 28.9% | 12.6% | | | |

Typical channel section about 1 week after construction. Note construction has destroyed temporarily the vegetation along one bank.

Typical channel section in same area as above about 1 year after construction. Note vegetation initially destroyed by construction is now well established.

Crops on the contour reduce erosion and sediment

A good winter cover crop protects the soil from winter rains.

Periodic blue-green algae blooms could occur during extended periods of low flow. However, the drainage area of the weirs is large enough to provide a frequently flushing action except during extended dry periods. *Anabaena* and *Microcystis* would be the most likely algae species associated with prolonged dry periods. If these blooms materialize, the algae give off a toxic substance which can be fatal to fish. Also, when the bloom dies, the process of decomposition can cause an oxygen shortage and be fatal to fish. The Sponsoring Local Organization will be responsible for identifying problem areas and will consult with local fisheries biologists for the action needed to alleviate the problem. Copper sulfate or its derivatives will be used to control the algae blooms. Other impounded areas in the watershed do not presently have aquatic weed problems that have developed to nuisance levels.

Three miles of channels containing ponded water will be modified. Existing quality and quantity of fisheries are low. Losses of bank and in-channel cover and disruption of the benthic community will occur. Water temperatures in the summer months will be increased about 5 degrees Fahrenheit. A slight lowering of the biological productivity will result during construction. Recovery of productivity will begin when construction ceases. Complete recovery to the current biological productivity will depend on the recovery of the benthic community, recovery of adequate cover in the channel, and recovery of the current water quality levels. This will take about 1 year following construction. The species diversity is not expected to change because the existing species such as carp, gars, shad, and bullheads can tolerate low-quality habitat.

Effects of project construction of the fisheries in 17 miles of previously-modified intermittent channels will be similar to that described for the channels with ponded water. Water temperature will not be a critical impact on intermittent flow channels because these channels have water in them only during winter, early spring, and during periods of storm-water runoff.

One hundred and sixty-one miles of ephemeral channels will be worked. Presently, a fishery does not exist because ephemeral flow channels contain water only during periods of surface runoff. Limited production of fish food organisms occurs in these channels and consists mainly of larval forms of insects. This production will be temporarily interrupted during construction.

Even though individual channels will experience some increase in sediment and turbidity during construction, the net effect over the watershed should be a decrease.

Turbidity in Boeuf River, Bayou Macon, and Tensas River at the project channel outlets may be increased temporarily during construction. However, the present species of fish will tolerate the slight changes in water quality, and neither the diversity nor the standing crops of fish will be affected.

Turbidity levels in Bayou Macon "cutoff No. 3" during construction of Channel M-12 will be dependent upon the sequence of the installation of the land treatment measures in comparison to the construction schedule and other conditions. Four of the most important conditions are precipation patterns, soil types, and channel flow, and the length of time required for the disturbed areas to revegetate. No excavation will be done on the lower 2.8 miles of Channel M-12. This undisturbed section will help to filter the water entering the cutoff. Excavation will be done from one side only for a distance of 1.6 miles on the upper end of the channel. Channel L-12A is a lateral to the M-12 system It will enter M-12 in the undisturbed section 1.2 miles above "cutoff No. 3" and excavation will be done on one side only for a distance of 2 miles.

Project induced turbidity increases will reduce the game fish population in Bayou Macon "cutoff No. 3" if installation of land treatment measures lags in the drainage area before channel construction begins and if measures to control construction-generated turbidity are not installed. This niche from game fish populations would be filled by commercial species such as carp, catfish, and shad. Game fish population is "in balance." Game fish could be reduced to about 20 percent of the standing crop if the turbidity caused by construction is not offset by the installation of land treatment measures and measures to reduce construction-induced erosion. A monitoring program, which includes fish population samples, will detect any changes in standing crop and species composition. Should a reduction or species composition change occur, the loss will be restored by restocking the cutoff after turbidity levels in the cutoff have recovered to an acceptable level. The net effect of the land treatment measures after project installation should result in a reduction of sediment and turbidity and subsequent recovery of water quality in "cutoff No. 3."

The current land use of the drainage area of Channel M-12 is 600 acres of forest land, 2,935 acres of cropland, and 980 acres of pastureland. The 600 acres of forest land should remain unchanged under project conditions. The land clearing trend has stabilized and the 600 acres are scattered in small tracts. In addition to timber production, these forested tracts are used as a source of firewood by the owners, and habitat for many game and nongame species of wildlife.

The temporarily increased turbidity levels that will occur during construction in Bayou Macon "cutoff No. 2" will not significantly affect the fish population because of the high percentage of gizzard shad. The game fish - bluegill, spotted sunfish, warmouth, and chain pickerel will tolerate increased turbidities without deleterious effects. An undetermined reduction of phytoplankton will occur at the outlets of the project channels, but will start recovering when the disturbed areas revegetate and turbidities in the channels are comparable to existing conditions. This should take from 3 to 6 months.

No significant land use changes will occur in the drainage areas of M-7, M-8, M-9, and M-10 after construction. The current land use is

1,450 acres of forest land, 5,475 acres of cropland, and 1,825 acres of pastureland. The forest land occurs in small scattered tracts. Land use in the drainage area has been relatively stable for the past several years.

Channel M-14 outlets into the lower portion of Big Lake. The lower one-fourth mile of this channel between the lake and the watershed boundary is adequate and no excavation is planned on this portion. The only change in water quality as a result of the project will be a temporary increase on turbidity during construction. Agricultural runoff entering Big Lake will be the same for preconstruction and postconstruction. No adverse effects to the fisheries will occur.

Eutrophication or aquatic enrichment in downstream environments is not expected to change as a result of the project. Farmers in the project area will increase their use of fertilizers by an estimated 1,300 tons annually. The 1,300 tons applied annually will be a result of project implementation which will result in more intensive agricultural operations because of better drainage and reduced floodwater damages. Historically, increases in nutrients have occurred in downstream areas when intensive agriculture is the dominant land use. Amounts of nutrients in these areas are directly related to the amount of soil erosion. The application of land treatment measures in this watershed will reduce erosion and consequently, a reduction in nutrient levels should also occur in downstream environs. Soil fertility under continuous cropping will decline without use of fertilizers. Fertilizers presently account for about one-third of the production of our total food supply.[1/]

Phosphates enter the water from many sources including sewage treatment plants, barnyard wastes, use of detergents and surfactants, biological wastes, and agricultural fertilizers. Excessive amounts of phosphate will result in eutrophic or overfertilized conditions in aquatic ecosystems, especially if large amounts of nitrates are present.[2/] Soil particles have a high affinity for holding onto phosphate molecules.[3/] Phosphates are relatively insoluble in water, resulting in low concentrations

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1/ U.S. Department of Agriculture, Soil Conservation Service. "Water Pollution from Agriculture," Missouri's All Employees Training Conference-Framework for the Future (Unpublished compilation of speeches and training sessions made at the training conference, 1972), pp. 42-51.

2/ Water Analysis Handbook (Ames, Iowa: Hach Chemical Company, 1973).

3/ U.S. Department of Agriculture, Agricultural Research Service, Wastes in Relation to Agriculture and Forestry (Washington: U.S. Government Printing Office, 1968(, pp. 37-39.

under normal conditions.[4] The extensive use of fertilizers in farm ponds for fish production indicates that land runoff is a poor source of the needed phosphorous. Erosion of topsoil is the main source by which phosphorous from farmland reaches streams.[5]

Nitrate represents a common and stable state of nitrogen found in water. Nitrate-rich effluents discharged into waters can degrade water quality by encouraging excessive growth of algae.[6] The Soils Department at Washington State University studied nitrate content of well water in areas where different application rates of fertilizer had been used. They found that high nitrate in the well water was not a direct consequence of heavy fertilizer use.[7]

The best control methods for preventing fertilizer nutrients from entering aquatic ecosystems are to use only the needed amount of fertilizer and to use management practices that will reduce erosion to a minimum. The project will be conducive to such practices.

A monitoring program has been developed for this watershed to determine preproject and postproject water quality conditions, fish populations, and pesticide levels. This program will include a close study of land use changes that occur in the drainage area above each sampling station. The three sample stations are located on (1) the lower reaches of Deer Creek, (2) Bayou Macon "cutoff No. 2," and (3) Bayou Macon "cutoff No. 3." This program is being conducted jointly with the Feeds and Fertilizer Laboratory at Louisiana State University, the Louisiana Wild Life and Fisheries Commission, the U.S. Fish and Wildlife Service, the Louisiana Board of Health, and the U.S. Geological Survey.

The monitoring program will measure fish populations and pesticide residues in fish tissue, channel soil, and water. Nutrients from fertilizers will be measured in the aquatic environment to identify the amounts of nitrogen and phosphorus. Water samples will be analyzed to determine suspended solids, turbidity, temperature, sulfates, pH,

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4/ Richard H. Wagner, Environment and Man (New York: W. W. Norton and Company, Inc., 1971), p. 122.

5/ U.S. Department of Agriculture, Wastes in Relation to Agriculture and Forestry, op. cit., p. 38.

6/ Water Analysis Handbook, loc. cit.

7/ Institute of Agricultural Sciences, Nutrient Input to Soils from the Air, Circular 415 (Washington: Washington Agricultural Experiment Station).

oxygen, color, and hardness. The project will be monitored for 2 years preproject and sufficient time after completion of construction until conditions stabilize. This information will be used to determine if the project is causing significant increases in the deterioration of water quality and provide a means for determining appropriate modifications that could be made.

Wildlife Resources - Squirrels are dependent on mast production for their food supply. The later stages of plant succession are more conducive to high squirrel populations. Squirrels maintain a higher population on existing habitat conditions along channel rights-of-way than would be present after construction. After about 20 years, trees should be matured to restore this area to its former condition. About 277 acres[8/] of bottom land hardwood habitat will be cleared for rights-of-way.

White-tailed deer have a highly diversified diet. Both browse and mast are important food items. The vegetative community that now exists is more productive deer habitat than that which will exist following construction. The clearing of 277 acres of hardwoods will be detrimental to the deerherb. However, browse and resting cover will be available on the berm and spoil.

Mourning doves and bobwhite quail are limited mainly to open land areas in the project area. The forested edges are utilized for nesting and escape cover. About 708 acres of narrow wooded channel banks and previously mentioned forested areas will be converted to open land. This conversion to open land will be beneficial to doves and quail. After a period of about 3 years, the open land condition will change to a brush-type habitat, causing its usefulness as feeding areas for doves and quail to diminish. Quail will utilize this brush-type habitat as escape cover.

Rabbit habitat along channels will be good after project construction. Grasses will be established on the berms and spoil. The only habitat loss computed for rabbits will result from the increase in channel size. This amounts to 143 acres.

Wild turkeys maintain high populations in large forested areas with interspersed openings. The clearing of 277 acres of hardwoods will further reduce the main habitat type for this bird. Some new food items will be available for turkeys on the berms and spoil after construction.

The impacts of this project on the "endangered" animal species and the "threatened" plant species that possibly occur will be minimal. The

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8/ The 277 acres is the disturbed channel rights-of-way; it excludes the existing channel acreage.

habitat for animals, however, is being further depleted by the cumulative impact of this project and many similar projects. One plant species, the silky Camellia, has been reported from Catahoula Parish where Channel M-1 is located. The chances of this plant occurring here are remote, however, since it will not thrive on the poorly-drained clay soils that exist along this channel.

Nongame animal populations will be altered. Open land species should increase and forest land species should decrease. The tabulation shows the changes in habitat and estimated number of game animal changes as a result of construction.

The first column lists the species of game that will be affected by project construction. The second column lists the type of habitat affected by project construction. The third column lists the acres of each habitat type affected. The fourth column lists the game animals lost or gained because of habitat loss or gain.

Changes in Habitat and Number of Game Animals
As a Result of Project Construction
East Franklin Watershed

| Species | Habitat | Acres | Number of Animals |
|---|---|---|---|
| Deer | Forest Land | - 277 | - 14 |
| Squirrel | Forest Land | - 277 | - 185 |
| Dove[a] | Open Land | + 708 | + 118 |
| Quail[a] | Open Land | + 708 | + 14 |
| Rabbit | Forest Land & Open Land | - 143 | - 14 |
| Wild Turkey | Forest Land | - 277 | - 3 |
| Waterfowl[b] | Forest Land | - 277 | - 18 |

a/ Temporary Gain

b/ Migratory

Installation of a structure for water control (weirs) in Channel M-20 will insure the preservation of present water levels on 147 acres of Type 7 wetlands and 23 acres of Type 5 wetlands. The remaining 4,170 acres of wetlands will not be affected by project action.

Archaeological, Historic, and Scientific

There are no properties listed in the National Register of Historical Places that will be affected by the installation of structural measures. This project will have no effect on any known archaeological or historical sites.

Economic and Social

Agriculture, the economic base of the watershed, will be enhanced. The project will increase agricultural productivity which, in turn, will increase the net return of processors and sellers of agricultural products as well as other goods. These increased returns will enhance the income of farm laborers and other agricultural workers.

The average annual gross sales of farm products are expected to increase by approximately 17 percent. In order to realize this increase, average annual production costs will increase by about 2 percent. This increase will consist primarily of additional costs incurred for harvesting larger volumes of crops as a result of project measures.

The higher level of protection, the reduced fixed cost of production, and the increased quality of products will give farmers an incentive to increase production inputs. They will buy better quality seed and will use more fertilizer and lime to attain higher future yields. Expenditures for fuel and other petroleum products used in harvesting and hauling the product to market will increase. This will stimulate economic activity within the watershed as well as the surrounding areas. More jobs will be created in the processing and service industries. The value of property will increase, which will provide for a higher tax base. Thus, the parish will have more funds to develop health, recreational, educational, and other needed facilities.

Installation of the project will create about 59 man-years of local labor for a 5-year period. The expenditure of $3,938,000 for the installation of land treatment measures will create an additional 170 man-years of labor throughout the 10-year period. Operation and maintenance will provide 150 man-years of local labor for the project life (50 years).

The project should slow the trend of decreasing number of farms and increasing size of farms. With the project, optimum-sized labor saving equipment will be used more efficiently on the farms. This and other factors will decrease production costs and increase yields, thus making farming more profitable. This will make farming more competitive for labor with other industries, thereby slowing the out-migration trend.

The project will directly benefit approximately 500 farmers, 2,000 farm family members and farm employees. It is estimated 400 of these farmers will benefit from both structural measures and land treatment and the remaining 100 will benefit from accelerated land treatment. This will bring outside resources into the community and will provide an opportunity to use goods, service, and labor from the local area.

The average annual net farm income will increase about $1,200 per farm. With this increase, farm income will tend to be more stable. The additional income will enable farm families to improve their standards of living including better health care and in general, enhance their social well being.

The problems caused by flooded roads will be reduced. Schoolbuses will be able to travel their scheduled routes more regularly which will improve school attendance. The public will be better able to utilize the roads for farming operations and marketing, and for commuting to places of employment and business during wet periods. Nuisance damages to residences will be reduced.

Local traffic patterns will be interrupted temporarily during the replacement of bridges and culverts resulting in inconveniences to the people involved. Detour routes will be available such that no one will be deprived of access to their destination. Noise levels will increase at the construction sites. Increases in turbidity will occur downstream temporarily until the exposed areas are revegetated.

Local secondary benefits will accrue after the installation of project measures. The values added to the immediate products and services as a result of activities stemming from or induced by the project will enhance the overall local economy. The increased production of goods stemming from the project will place new demands on the processing, transporting, and marketing industries within the area. Processors, business establishments, and other individuals not directly benefited will profit from increased sales of their agricultural associated goods and products. Suppliers of the needed materials and services required to make possible the benefits expected expected from installation of the project will realize an increased net income. The increased production of goods and services induced by the project will stimulate local and regional economic activity.

Favorable Environmental Impacts

Sheet erosion will be reduced from 867,000 tons per year to 776,000 tons per year. This reduction which amounts to 91,000 tons per year, will be a result of the accelerated land treatment program.

Sediment being delivered to the watershed outlets will be reduced from 305,000 tons per year to 224,000 tons per year. This reduction of 81,000 tons per year amounts to 26.5 percent.

Average annual flood damages to 100 miles of roads will be reduced.

The creation of 147 acres of permanent water will result in additional water for agricultural uses and fish and wildlife habitat.

Durations and peak stages of overbank flooding on project channels will be reduced. (Damages will be reduced in benefit areas).

Average annual net farm income will increase.

The average annual allocated agricultural floodwater damages will be reduced 81 percent.

A total of approximately 76,200 acres of cropland and pastureland will benefit from the combined program of land treatment and structural measures. These benefits will be improved drainage and protection from flooding.

About 820 farmers, 2,900 farm family members, and the employees of those farmers will benefit from the project. Benefits will include increased income resulting in improved living conditions, better farming equipment, higher education, and better health care.

Improved farming efficiency resulting from project installation will reduce the average annual fixed cost of production.

Installation of the project will create about 59 man-years of local labor for a 5-year period. The expenditure for the installation of land treatment measures will create an additional 170 man-years of labor throughout the 10-year period. Operation and maintenance will provide 150 man-years of local labor for the project life (50 years).

The average annual gross sales of farm products will increase about 17 percent.

There will be an increase in habitat for open land species.

Forest management practices will increase wildlife carrying capacity to existing forest lands.

## Adverse Environmental Effects

Construction erosion will generate 15,000 tons of sediment during the projected construction periods of 3 years.

About 264 acres of forest land, 383 acres of wooded channel banks, and 393 acres of open land will be disturbed by construction in addition to that already existing. This will result in reductions of both game and nongame animals.

Turbidity in the outlets will increase "locally" during construction of project channels.

Water temperatures in ponded water channels will be increased about 5 degrees Fahrenheit.

The biological productivity of 3 miles of ponded water will be lowered.

Occasional periods of excessive aquatic weed growth may occur in the permanent water created by the 28 structures for water control (weirs).

Peak stages on portions of Bayou Macon, Tensas River, Roaring Bayou, and watershed channels will be increased by amounts ranging from infinitesimal to an estimated 0.2 foot during some floods.

There will be a reduction in air quality during construction.

## ALTERNATIVES

Because the topography upstream from the problem area is flat, sites for water impoundment are not available. Therefore, floodwater retarding structures are not considered an alternative.

### Land Treatment Only

The major land treatment measures that could be installed are conservation cropping systems, crop residue management, land smoothing, drainage field ditches, pasture and hayland management, forest management, pasture and hayland planting, wildlife wetland habitat management, and wildlife upland habitat management. These measures could only be installed to treat adequately about 20,000 acres of cropland and pastureland that have little or no damages from flooding and inadequate drainage. In addition, some land treatment could be installed on some marginal land; however, the effectiveness would be limited because of floodwater and drainage problems. The installation cost would be about $880,000.

Land treatment measures to reduce wetness by increasing the infiltration of water into these soils are impractical. Most of the bottom land soils are fine textured throughout and some loessial terrace soils have a restrictive layer below the surface. These conditions restrict the downward movement of water in these soils. Land treatment measures such as drainage field ditches and land smoothing or grading are needed to remove water at or near the surface. These measures could be applied and are presently being applied for this purpose. However, the system of outlets is inadequate. For these reasons, land treatment alone would not provide benefits sufficient for project purposes.

### Levee and Pump System and Land Treatment

The flat topography lends itself to establishing levees and installing pumping plants around individual farms or evaluation units. An internal drainage system within each enclosed unit is required to remove the water from within the leveed areas. It is impractical to pump this volume of water. The cost of installing the levee and drainage system is $23,000,000 and the annual operation and maintenance cost is $400,000.

The land treatment program would include conservation measures to treat 92,100 acres at a cost of $3,983,000. The conservation measures would include but not be limited to conservation cropping systems, crop residue management, land smoothing, drainage field ditches, pasture and

hayland management, pasture and hayland planting, wildlife wetland habitat management and wildlife upland habitat management. These measures would be installed singly or in combination as needed.

This alternative would provide a high degree of protection from flood and drainage problems. Larger channels would be required and approximately 6,813 acres of land would be permanently committed to levees.

Change Land Use to Enterprises that will Tolerate Wet Soil Conditions - Nonstructural alternative uses of the land include forest land, wildlife wetland development, and fish farming.

The Nation's demand for timber products is certain to increase in the future. If present trends of management continue, the demands for forest products will exceed the supply.

Southern hardwoods can thrive in the poorly-drained areas of the watershed and can be planted at a cost of $50 per acre. The first intermediate cutting for pulpwood can be made at age 25. Under current management levels, average annual returns from land in hardwood timber is about $4 per acre for forest products[1/] and $0.25 to $3 per acre for wildlife leases.[2/]

Under this alternative, it is estimated 58,000 acres of land could be converted back to bottom land hardwoods at an average annual cost of $1.23 per acre. Likewise, full level annual returns were estimated at $1.95 per acre.

Under present drainage conditions with this alternative, approximately 5,000 acres of wildlife wetland areas could be developed to provide food and water for waterfowl, furbearers, crawfish, and other wildlife. Development for these purposes would require construction of levees, development of water supplies, and installation of pumps and water control structures.

Average annual establishment costs for this purpose are estimated to be $100 per acre. Average annual monetary benefits would be approximately $25 per acre.

Fish farming has been introduced into the area and a potential exists under present drainage conditions for additional development.

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1/ U.S. Department of Agriculture, Soil Conservation Service, Technical Guide, Franklin Parish, Section V.

2/ Richard K. Yancey, The Vanishing Delta Hardwoods and Their Wildlife Resources (Baton Rouge: Louisiana Wild Life and Fisheries Commission, 1969), p. 7.

The initial capital outlay for developing a fish farming operation is approximately $380 per acre.3/ The risks in producing a harvestable crop are high and market opportunities for small operators are limited. Annual returns from this enterprise average $160 per acre.4/ It is estimated fish farming would increase approximately 20 percent and provide an estimated $4,000 of additional average annual net benefits.

Most of this change in land use would occur on poorly-drained soils in the watershed. It is estimated a total of 63,000 acres of cropland would be shifted to the 58,000 acres of forest land and 5,000 acres to the wildlife wetland habitat.

The average annual benefits of $21,300 accruing to wildlife wetland development would not accrue in total directly to landowners. It would be distributed among the various sectors of the local economy for food, lodging, supplies, fuel, etc. The accrual of these benefits would also be dependent on hunting pressure and the population of the waterfowl occupying these areas. This shift in cropland would result in an estimated average annual loss of $581,000 of net returns based on present conditions. The total average annual costs of this alternative are estimate to be $658,300 and total average annual benefits would be approximately $334,200. The total average annual net benefits foregone by this alternative in lieu of a combination of channel work and land treatment would be $1,202,000.

## Channel Work and Land Treatment

Various sizes and lengths of channels were studied to determine whether the 1.5 year, 4-year, or 7-year level of protection would be the most desirable. The effects of each of these levels of protection were evaluated without- and with-project conditions. The effects of 1.5-year and 7-year levels were considered to be alternatives and are discussed in this section. The 4-year level on which the project is based is discussed in the ENVIRONMENTAL IMPACTS section.

The land treatment measures to be installed for this alternative would include but not be limited to conservation cropping systems, crop residue management, land smoothing, drainage field ditches, pasture and hayland management, pasture and hayland planting, wildlife wetland habitat management, and wildlife upland habitat management. These measures would be installed singly or in combination as needed.

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3/ James T. Davis and Janice S. Hughes, Channel Catfish Farming in Louisiana (Baton Rouge: Louisiana Wild Life and Fisheries Commission), p. 28.

4/ Ibid.

The 4- and 7-year level of protection would provide the same benefits described previously. However, the outlet limitation of the 1.5-year level of protection would reduce the effectiveness of the land treatment program and the amount of land that could be treated adequately.

Also, wildlife habitat changes and effects on animal populations were studied. These are shown in the tabulation on the following page for the three alternative levels of protection along with the standing crops of fishes for preproject and postproject conditions.

Providing a 1.5-Year Level of Protection - This would require 169 miles of channel work with 1,615,000 cubic yards of excavation. The total structural measures cost would be $3,086,900. The annual cost, including operation and maintenance, would be $301,500; the damage reduction would be 45 percent.

Land used for channels would change in the following manner:

1. Land within channels would increase from 923 to 949 acres.

2. Land used for berms would increase from 112 to 491 acres.

3. Land used for spoil would increase from 204 to 619 acres.

Land used for channels and berms will increase because increased channel widths require wider berms. Land occupied by spoil in forest land and wooded channel bank areas will increase because existing and project-created spoil will not be spread.

Type of habitat in which channels are located was categorized according to examples shown in the Plant and Animal Resources section. Channels located on cropland or pastureland which had no trees or brush on the berms and spoil were categorized as "open land" channels. Channels located in cropland or pastureland having narrow strips of trees or brush on the berms and spoil were categorized as "forest." Land used for channels, berms, and spoil within these three categories would change in the following manner:

1. Open land acres occupied would increase from 306 to 633 acres.

2. Wooded channel bank acres occupied would change from 597 to 885 acres (part of this total would be converted to open land).

3. Forest land acres occupied would change from 336 to 541 acres (part of this total would be converted to open land).

The increase in wooded channel bank acreage occupied would be a change in wildlife habitat because the channel and berm would contain only scattered trees under the maintenance program. Open land permanently

occupied includes only the channel and berm. The spoil is to be spread and is not considered a loss of resource. Spoil disturbed in the wooded channel banks and in forest land would be allowed to grow back into trees by natural plant succession. Of the 2,059 acres required for channels, 123 acres would require clearing only and 1,936 acres would require excavation.

The land treatment program under this level of protection would include conservation measures to adequately treat 41,000 acres of cropland, pastureland, and other land. In addition, 20,000 acres of cropland and pastureland will have some land treatment measures installed. The cost would be about $1,763,000. The measures to be installed include the same as discussed under Floodproofing and Land Treatment.

Providing a 7-Year Level of Protection - This would require 192 miles of channel work with 2,567,000 cubic yards of excavation. The total structural measures cost would be $4,577,100. The annual cost, including operation and maintenance, would be $421,300. The damage reduction would be 88.4 percent.

Land used for channels would change in the following manner:

1. Land within channels would increase from 923 to 1,141 acres.

2. Land used for berms would increase from 112 to 532 acres.

3. Land used for spoil would increase from 204 to 738 acres.

Land uses for channels and berms will increase because increased channel widths require wider berms. Land occupied by spoil in forest land and wooded channel bank areas will increase because existing and project-created spoil will not be spread.

Land used for channel, berms, and spoil within the three categories--open land, wooded channel bank, and forest--would change in the following manner:

1. Open land acres occupied would increase from 306 to 738 acres.

2. Wooded channel bank acres occupied would change from 597 to 1,038 acres (part of this total would be converted to open land).

3. Forest acres occupied would change from 366 to 635 acres (part of this total would be converted to open land).

The increase in wooded channel bank acreage occupied would be a change in wildlife habitat because the channel and berm would contain only scattered trees under the maintenance program. The open land acres permanently occupied include only the channel and berm. The spoil is to

be spread and is not considered a loss of resource. The acres of spoil disturbed in the wooded channel banks and in forest land would be allowed to grow back into trees by natural plant succession. Of the 2,410 acres required for channel work, 143 acres would require clearing only, and 2,267 acres would require excavation.

The land treatment program would include conservation measures to adequately treat 92,100 acres of cropland, pastureland, and other land. In addition, 44,400 acres of cropland and pastureland will have some land treatment measures installed. The cost would be $3,983,000. The measures to be installed include the same features discussed under the Floodproofing and Land Treatment alternative.

Alternative Locations of Channel Work - Varying degrees and locations of channel work were investigated with assistance from the Louisiana Wild Life and Fisheries Commission and the U.S. Fish and Wildlife Service. Specific channels investigated were M-16, L-16A, M-5, M-12, L-12A, M-20, L-1B, M-21, M-9, L-9A, M-19, L-19A, L-19B, M-1, L-1A, L-1C1, L-1F, L-1F1, M-2, L-2A, L-2B, L-2C, L-2G, M-3, M-4, M-4A, and M-17. These channels were studied with specific emphasis on fish and wildlife resources. The alternatives studied for each of these channels are listed by channels as follows:

1. M-16 and L-16A - Two layouts were proposed for this system. The first proposal was to start M-16 at Big Roaring Bayou about 0.5 mile above Louisiana Highway 4, following a northwesterly direction in a slough then due west about 14,500 feet. Begin L-16A in Long Bayou at its confluence with M-16 and follow in a northwesterly direction a slough ending in the low area near Beeler Lake. The second layout proposed was to start M-16 in Long Bayou approximately 0.5 mile south of Louisiana Highway 4, then enter a slough that courses in a westerly direction approximately 7,500 feet. L-16A leaves M-16 approximately 3,000 feet from the upper end and extends 1 mile due north. The first layout would result in adverse effects to 30 acres of Type 1 wetlands. The second layout was selected to prevent disruption of 4 miles of previously-unmodified, natural channels in bottom land hardwood forest. In the second layout, only 1.5 miles of previously-modified channels through bottom land hardwood forest will be affected. Consequently, the acreage of forest land required for channel rights-of-way would be larger for layout number one.

2. M-5 - One proposal was made to route a channel through Boggy Womble Brake to intercept water from the Macon Ridge to prevent inundation of open land east of the brake. This channel route would result in the drainage of 110 acres of Type 7 wetlands.

3. M-12 and L-12A - Biologists recommended that excavation be limited as much as possible to eliminate temporary increases in turbidity in Bayou Macon "cutoff No. 3." It was determined that the lower 2.8 miles (15,000 feet) of channel could be left in its present condition with excavation being limited to the upper 1.6 miles (8,364 feet). L-12A is an estimated channel and a study will be made during the operations stage to determine to what extent excavation can be eliminated on the lower end.

   The lower end of these channels left in the present condition will provide filtering medium for runoff entering into "cutoff No. 3."

4. M-20 - Two routes were studied to locate the lower end of M-20. The first route begins in Tensas River approximately 8,500 feet downstream from M-18 in a slough extending in a west-northwesterly direction approximately 3,500 feet, then in a westerly meandering direction approximately 5,000 feet, then in a southwesterly direction to the confluence with Wiley's Brake. The second route begins approximately 6,500 feet farther south at a bend of the Tensas River in a slough and extends approximately 2,000 feet in a southwesterly direction then in a northerly direction for approximately 5,000 feet and intersects the route described above. Both outlets are adequate. The second route is presently in a stable condition and a grade stabilization structure is not required to empty into Tensas River. It also provides approximately 6,200 feet more undisturbed area. This would filter out more sediment from the runoff prior to reaching the Tensas River.

5. L-1B - One proposal was to extend the channel through a block of forest land to more effectively serve the area sloping away from Bayou Macon. This would include 800 feet of construction of channel through the forest land. A second proposal was to end the ditch in a low area prior to entering the forest land. This backwater flooding occurs primarily in the area of the Sharkey-Tensas Soil Association. The second proposal would eliminate construction through 800 feet of forest land and preserve approximately 1.1 acres of channel rights-of-way through bottom land hardwoods. This would also reduce the probability of clearing the block of forest land. Drainage and flood protection can be obtained by diverting runoff to another route.

6. M-21 (Dean's Bayou) - One route was proposed and varying limits of channel work were studied. The proposal adopted would reduce excavation and clear the trees and debris necessary to allow passage of required flow. This proposal would also eliminate the possibility of lowering the water level in Lake Dean.

7. M-9 and L-9A - Hurricane Bayou designated M-9 begins near Louisiana Highway 577 Crossing in Bayou Macon "cutoff No. 2." Martin Slough designated L-9A begins at M-9 approximately 24,000 feet upstream near Waverly Church. One proposal was to excavate all M-9 on the west side of Louisiana Highway 17 up to the gravel road extending west from Louisiana Highway 17, 2.5 miles north of Bakers, and excavate all of L-9A. The second proposal was to excavate M-9 on the west side of Louisiana Highway 17 approximately 630 feet upstream (station 95+00 to station 158+25) and from 1 mile north of Lamar to the gravel road extending west from Louisiana Highway 17, 0.5 mile north of Bakers (station 334+50 to station 435+40) and clear only to the blacktop road extending west from Louisiana Highway 17 about 2.5 miles north of Bakers with no work on the upper 6,600 feet. In this proposal, the possibility of diverting L-9A into M-9 in the vicinity of Lamar Church (Section 33) will be determined during the operations stage. Five structures for water control (weirs) will be installed in M-9. The second proposal requires a reduced amount of excavation and would produce less sediment and turbidity during the construction period. The weirs will trap about 1 percent of the sediment produced by sheet erosion and about 30 percent of the sediment produced during the construction period (estimated 1,640 tons). This proposal would leave the 5,700 feet of unmodified natural channel on the upper end of its natural condition.

8. Channel System Above Lake Dean - (M-19, L-19A, and L-19B) - The first alternative would require channel work on the existing system draining into the Lake, then improving the outlet via Dean's Bayou. This alternative would increase the rate of eutrophication of Lake Dean. Other routes were investigated in an effort to direct flow from farm land above Lake Dean. One approach would require a dam on the upper end of Lake Dean and a diversion channel cut through a ridge to outlet via Wiley's Brake. This would require construction in soil conditions and would cause deterioration of Wiley's Brake. A second approach would require a diversion channel paralleling Lake Dean with spoil being placed on the lake side to prevent flow from entering the lake. The cost of this approach would exceed the cost of works above the lake. Eliminating the entire M-19 system because of the possibility of extensive damage to aquatic and terrestrial ecosystems within the area of the drainage system was also investigated.

9. Other channels investigated to eliminate excavation on the lower end are: M-1, L-1A, L-1C1, L-1F, L-1F1, M-2, L-2A, L-2B, L-2C, L-2G, M-3, M-4, M-4A, and M-17.

ALTERNATIVE

Levees and Floodgates to Protect Against Backwater Flooding from Tensas River - Construction of levees and floodgates were considered as a solution to prevent backwater flooding. A study of gage records was made to determine the frequency of backwater flooding. There is a 30 percent chance (3 in 10) that backwater flooding will occur on an annual basis and a 10 percent chance during the soybean growing season. This backwater flooding causes no damage to residences and only minor damage to crops. The cost of installing a levee and floodgate system to protect against backwater flooding from Tensas River is $3,500,000. The annual operation and maintenance would be $100,000.

No Project

The "No Project" alternative would include the current land treatment program. At present, 7 percent of the cropland and pastureland has received adequate land treatment. Land adequately treated is defined as land used within its capabilities on which the proper conservation practices have been applied to compensate for its limitations. The tabulated data on the following page summarizes the land treatment measures applied to date and costs. With "No Project," the current rate of installation of land treatment measures will remain about the same.

Water problem areas will continue to exist with this alternative. Sponsors do not have sufficient funds to finance the installation of a complete channel system. Only limited work on certain channels would be done. No orderly, planned procedure would be followed. Installation of appurtenant measures needed to control erosion and sediment would not be installed. This haphazard approach would result in damages to the vegetative communities and aquatic ecosystems that would not be mitigated. The pursuit of this alternative would result in little emphasis being placed on environmental values. If the project is not installed, net annual benefits of about $884,800 will be foregone.

STATUS OF LAND TREATMENT MEASURES

East Franklin Watershed, Louisiana

| | Unit | Applied To Date | Total Cost1/ (Dollars) |
|---|---|---|---|
| Land Treatment | | | |
| Chiseling & Subsoiling | Ac. | 6,600 | 34,200 |
| Conservation Cropping System | Ac. | 12,600 | 49,000 |
| Contour Farming | Ac. | 200 | 800 |
| Crop Residue Management | Ac. | 24,700 | 64,000 |
| Drainage Field Ditches | Ft. | 422,500 | 54,800 |
| Drainage Land Grading | Ac. | 4,100 | 462,200 |
| Drainage Mains & Laterals | Ft. | 383,600 | 74,500 |
| Grade Stabilization Structures | No. | 4 | 2,100 |
| Irrigation Field Ditches | Ft. | 54,600 | 21,900 |
| Irrigation Land Leveling | Ac. | 100 | 11,300 |
| Irrigation System | No. | 24 | 108,900 |
| Land Smoothing | Ac. | 300 | 3,900 |
| Pasture & Hayland Management | Ac. | 3,700 | 19,200 |
| Pasture & Hayland Planting | Ac. | 10,100 | 392,700 |
| Structures For Water Control | No. | 200 | 38,900 |
| Improvement Cut | Ac. | 10,700 | 13,900 |
| Cooperative Forest Fire Control | Ac. | 36,900 | 28,700 |
| TOTAL | | | 1,381,000 |

1/ Price base 1974.

May 1974

## SHORT-TERM VS. LONG-TERM USE OF RESOURCES

The watershed lands are generally well suited for agriculture. Forest land has been progressively cleared since the area was first settled by farmers. Approximately 19 percent of the area remains in forest. Cropland and pastureland are expected to continue as the predominant land uses.

Improved soil conditions as a result of improved drainage provided by the project will result in higher crop yields. Some items of production costs will be less. These improved conditions should encourage farmers to apply needed land treatment measures. The increased application of land treatment measures will insure sustained production for future generations. This project is compatible with the long-term uses of the land. If the project is maintained as planned, it should continue to be effective in conserving land and water resources after its designed 50-year life unless major changes occur in agricultural operations.

East Franklin Watershed is located in the Ouachita Water Resource Subregion of the Lower Mississippi Region. The entire Ouachita River Basin is covered by all or parts of 39 soil and water conservation districts, 28 in Arkansas, and 11 in Louisiana. Adequate land treatment has been established on about 40 percent of the basin area and progressing annually at about 2 percent of the total needs.

Of the total land area in the Ouachita Water Resource Subregion, about 33 percent is in some stage of development, planning, or requesting assistance under Public Law 566. Approximately 15 percent of the total land area in the Lower Mississippi Water Resource Region is covered by Public Law 566 projects which are either installed or approved for planning. The status of Public Law 566 projects for flood control can be observed in the tabulation on page 97.

Extensive flood control measures have been installed throughout the Lower Mississippi Region. The U.S. Army Corps of Engineers has modified the three outlets for this watershed: Tensas River, Bayou Macon, and Boeuf River. No further work on these three streams is authorized at the project channel outlets and downstream. Additional works by the Corps are planned on the Tensas River north of the project. This work involves 99 miles of "channel improvement."1/ The completed and planned improvements on the Tensas River, Boeuf River, and Bayou Macon will reduce the frequency and duration of flooding on 897,000 acres of fertile alluvial lands. Installation of

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1/ U.S. Army Corps of Engineers. Project Maps. A miscellaneous compilation of Maps and Progress Tables, 1973, p. 1-16A.

STATUS OF PUBLIC LAW 566 PROJECTS

| Item | Projects Installed | | Projects Approved For Planning | | Project Applications Received | | Total | |
|---|---|---|---|---|---|---|---|---|
| | (No.) | (Acres) | (No.) | (Acres) | (No.) | (Acres) | (No.) | (Acres) |
| Ouachita Water Resource Subregion | | | | | | | | |
| Louisiana | 1 | 186,072 | 13 | 2,065,806 | 5 | 515,780 | 19 | 2,767,658 |
| Arkansas | 10 | 295,669 | 12 | 787,790 | 8 | 1,436,132 | 30 | 2,519,591 |
| TOTAL | 11 | 481,741 | 25 | 2,853,596 | 13 | 1,951,912 | 49 | 5,287,249 |
| Lower Mississippi Water Resource Region | | | | | | | | |
| Louisiana | 6 | 296,590 | 21 | 2,819,270 | 7 | 531,820 | 34 | 3,647,680 |
| All Other States | 19 | 501,044 | 40 | 6,946,689 | Not Tabulated | | 59 | 7,447,733 |
| TOTAL | 25 | 797,634 | 61 | 9,765,959 | 7[a] | 531,820[a] | 93[a] | 11,095,413[a] |

[a] Does not contain applications received for states other than Louisiana.

this project should complete the works necessary for flood prevention in this watershed.

This project and other similar projects will reduce the amount of sediment delivered downstream because of the application of land treatment measures. The combined effects of all proposed or installed Public Law 566 watersheds on peak stages at outlets for the main channels of the watershed are tabulated in the ENVIRONMENTAL IMPACTS section. The largest estimated increase in peak stages caused by Public Law 566 measures will be 0.2 foot. This increase will occur on the Tensas River and on two watershed channels following a 4-year storm, and on the two channels following a 10-year storm. Maximum stage increases following a 100-year storm will be 0.1 foot. Stages downstream from the watershed on Boeuf River, Ouachita River, and Black River will not be increased by project measures.

## IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The total monetary value which will be expended for project installation, including land treatment and structural measures, amounts to $9,224,300. The expenditure of labor and capital needed for project installation, once expended, cannot be retrieved.

About 147 acres of land within selected channels will be committed to permanent water whereas presently it is in intermittent and ephemeral flow conditions. Structures for water control (weirs) will be located in the channel rights-of-way so no additional land will be required.

Land taken up by channels, berms, and spoil under "future without" project comprises a total of 1,239 acres. Land use of the 1,239 acres in channel rights-of-way is as follows: 306 acres in open land, 597 acres in wooded channel banks, and 336 acres in forest land. Following construction, land taken up by channels, berms, and spoil will comprise a total of 2,279 acres. A breakdown of the 2,279 acres is as follows: 699 acres in open land, 980 acres in wooded channel banks, and 600 acres in forest land.

Channels will preclude the use of 1,066 acres of land for any other purpose for at least the life of the project. Channels have to be maintained and kept clear of obstructions in order to function as planned. Grasses and forbs will be allowed to grow in the channels and on the berms. As previously mentioned, the channels will be dug from only one side. The undisturbed side in forest land will not be altered during maintenance operations. Portions of the disturbed side will have to be kept clear of trees so maintenance equipment will have access to the channel. The spread spoil area in open land may be used at the discretion of the landowner.

## CONSULTATION AND REVIEW WITH APPROPRIATE AGENCIES AND OTHERS

### General

On April 5, 1966, the Franklin Parish Police Jury passed a resolution to form the Franklin Parish Watershed Commission and named 11 commissioners to serve as a committee for the police jury in formulating a watershed work plan. In September 1966, an application for the East Franklin Watershed was signed by the Sponsoring Organization and was submitted to the State Soil and Water Conservation Committee. The State Committee approved the application in October 1966. The earlier application covered only the portion of the watershed in Franklin Parish. The authority to begin planning under Public Law 566 was granted on February 12, 1968. In 1969, the application was amended to include portions of Richland and Catahoula Parishes.

Organizations endorsing this application for assistance were the town of Winnsboro, the town of Gilbert, the town of Wisner, the Winnsboro Chamber of Commerce, and the Franklin Parish Farm Bureau, Inc.

A work outline was prepared to guide the development of a watershed work plan. The work outline identifies the responsibilities of the Sponsors and each discipline of the Soil Conservation Service with assistance provided by the Fish and Wildlife Service, U.S. Department of the Interior; the Forest Service, U.S. Department of Agriculture; and the Wild Life and Fisheries Commission, Forestry Commission, and Department of Public Works, State of Louisiana.

A meeting was held on April 16, 1968 with the Sponsors, the Louisiana Department of Public Works, and the Soil Conservation Service to coordinate planning efforts. The discussions included the design criteria to be used, the location of work for different contracts, measures to be included to reduce adverse impacts to fish and wildlife resources, and cost estimates.

In accordance with the work outline, the structural measures proposed in an earlier draft of the work plan were reviewed by the Louisiana Wild Life and Fisheries Commission. This review indicated that substantial adverse effects would occur. Extensive additional field reviews were conducted jointly with the Louisiana Wild Life and Fisheries Commission, the U.S. Fish and Wildlife Service, and the Soil Conservation Service biologists in an effort to identify the adverse effects. Upon completion of these exhaustive studies, a summary of the areas where adverse effects may occur was developed together with recommendations for measures to minimize these adverse effects.

Identifiable adverse effects jointly developed by the three agencies were reviewed with the Sponsors. Recommendations for eliminating and minimizing many of these effects were developed and agreed upon by the Sponsors. These recommendations are enumerated in the "Alternatives" section and constitute the basis for formulating the selected plan.

Three public information meetings were held by the Sponsors in various locations during the project formulation phase. The purpose of these meetings was to receive opinions and ideas from individuals, groups, agencies, and organizations on alternatives that should be investigated to meet the project objectives. Publicity was provided for these meetings through the Franklin Sun (with a circulation of 4,200), the Franklin Parish Farm Bureau News (with a circulation of 2,425), the Northeast Soil and Water Conservation District Newsletter (with a circulation of 2,489), and the local radio station. A notice of a public meeting held in March 1974 appeared in the Franklin Sun, the Monroe News-Star, the Monroe Morning World, the States Item and the Morning Advocate (Baton Rouge), the Shreveport Times, the New Orleans Item, and the Times Picayune (New Orleans). Radio and television coverage was given by radio station KMAR in Winnsboro and television station KNOE in Monroe. Notices of the March 1974 meeting were mailed to individuals, interested groups, organizations, and other agencies along with notices to the agencies involved in the planning process.

In a meeting in June 1972 the Forest Service and the Soil Conservation Service prepared a schedule of needs for forestry contributions to the watershed work plan.

Twenty-two meetings were held by the Franklin Parish Watershed Commission to make decisions necessary for plan formulation and to keep all agencies involved in the planning process informed on the progress of the plan.

In order to obtain viewpoints from a different source on environmental concerns, professional services were obtained from Coastal Environmental, Inc. Employees of this corporation have either M.S. or Ph.D. degrees in geography (flood plain management), zoology, marine science, chemistry, geology, and geo-chemistry. Their primary expertise is environmental evaluation and environmental impact statement preparation. A team representing interests in geography, biology, geology, and zoology reviewed the work plan and environmental impact statement and made suggestions for improvement.

Copies of the preliminary draft work plan and environmental impact statement were mailed to local, State, and Federal agencies and concerned groups for the informal field review. A public meeting was held on October 21, 1974 to present informal field review comments and the responses or changes resulting from these comments.

## CONSULTATION

Persons in the audience were given an opportunity to question and comment on the material presented.

The Louisiana Historical Preservation and Cultural Commission and the Curator of Anthropology of Louisiana State University were contacted to obtain the locations of places of historical and archaeological importance.

The U.S. Army Corps of Engineers in making their studies of the Boeuf and Tensas Rivers and Bayou Macon had divided the project areas into three zones of influence. These were:

1. A Zone - areas not flooding from the "flood of record" on the Boeuf and Tensas Rivers and Bayou Macon

2. B Zone - areas flooding between the levels of the "flood of record" and the 5-year frequency storm on the Boeuf and Tensas Rivers and Bayou Macon

3. C Zone - areas flooding from storms smaller than the 5-year frequency storm on the Boeuf and Tensas Rivers and Bayou Macon.

Some of these areas would also benefit from Public Law 566 projects. However, both the Corps and the Soil Conservation Service could not claim benefits on areas common to projects of each agency without "double counting" benefits. Therefore, a procedure was developed to share benefits.

In the "A" zone, there would be little effect from the Corps projects since these areas are above the "flood of record." Flooding and drainage problems existing in these areas would be allocated to Public Law 566 works.

The "B" zone is an area of influence common to projects of both agencies. The Corps projects improve the major outlets which are essential to improving internal drainage systems. Therefore, the Corps and Public Law 566 projects in this zone are complementary. In the "B" zone, the separation of benefits by acceptable procedures is not possible. Consequently, benefits are allocated to each agency's project according to the proportionate share of combined estimated costs for all projects of both agencies in the basin. On this basis, 87.35 percent of all benefits would be allocated to Corps projects and 12.65 percent would be allocated to Public Law 566 projects.

The "C" zone is influenced by projects of both agencies. However, the frequency of backwater flooding in these areas is so high that 100 percent of the benefits would be allocated to Corps projects.

CONSULTATION

Comments were requested on the Draft Watershed Work Plan and Draft Environmental Impact Statement from the following agencies, groups, and individuals:

Federal Power Commission
Department of the Army*
Department of the Interior - National Park Service
Department of the Interior*
Department of the Interior - Geological Survey*
Bureau of Public Works
Agricultural Stabilization and Conservation Service
Bureau of Outdoor Recreation
Environmental Protection Agency*
Department of Health, Education, and Welfare*
Department of Transportation*
National Marine Fisheries
U.S. Army Corps of Engineers
Department of Commerce
Department of Transportation - Coast Guard*
Advisory Council on Historic Preservation*
Wildlife Management Institute
Louisiana Commission on Intergovernmental Relations*
Louisiana Department of Public Works
Louisiana Wild Life and Fisheries Commission*
State Department of Highways - Louisiana*
Department of Art, Historical, and Cultural Preservation*
Louisiana Wildlife Federation, Inc.
State Parks and Recreation Commission - Louisiana
Governor's Council on Environmental Quality*
Sierra Club, Delta Chapter
Stream Control Commission
Louisiana Forestry Commission*
Louisiana Farm Bureau
Louisiana Division of Natural Resources and Energy
Louisiana State Soil and Water Conservation Committee
Center for Agricultural Science and Rural Development, Louisiana State University
Louisiana Cooperative Extension Service
Louisiana Department of Agriculture
Louisiana Department of Conservation
Louisiana Geological Survey*
Louisiana Joint Legislative Committee on Environmental Quality
Attorney General's Office Environmental Section
Bureau of Environmental Health, Water, and Air Quality
Office of State Planning
Office of Equal Opportunity
Louisiana Forestry Association
Mr. Clifford M. Danby
The Izaak Walton League of America
Audubon Society
National Resource Defense Council
Friends of the Earth
Environmental Defense Fund
Wildlife Federation
National Audubon Society
Environmental Impact Assessment Project

* denotes those that responded

Discussion and Disposition of Each Comment on Draft Statement

Each issue, comment, or suggestion for improvement is summarized and a response given on the following pages. The original letters of comments appear in Appendix I.

Louisiana Forestry Commission -

Comment: This is to advise that we have no objections to the Environmental Impact Statement for the East Franklin Watershed.

There is no doubt, however, that once the project is completed the rate of conversion of the remaining forest acreage to cropland and pastureland will no doubt be accelerated.

Response: There are two project channels located internal to. a large forested area. These channels are already in place and no accelerated clearing is anticipated as a result of installation of project measures. This is discussed on page 70 of the Environmental Impact Statement. No changes were made in the Environmental Impact Statement or Watershed Work Plan.

U.S. Department of Transportation - Federal Highway Administration -

Comment: We note that you have added in the statement provisions for coordinating the construction phase for replacement of highway bridges and culverts with the Louisiana Department of Highways. This work should be coordinated with them early in the design phase of the project. Other than this, we have nothing to add to our October 3, 1974 letter.

Response: The fourth sentence in the third paragraph on page 13 of the "PLANNED PROJECT" Section was revised to read as follows: "Replacement of any State and Federal highway bridges will be coordinated with the Louisiana Highway Department early in the design stage prior to construction." The same change was made in the "WORKS OF IMPROVEMENT TO BE INSTALLED" section of the Watershed Work Plan.

State of Louisiana - Commission on Intergovernmental Relations -

Comment: We have reviewed the Draft Environmental Impact Statement for the East Franklin Watershed with respect to agency impact and responsibility.

Enclosed herewith is a list of additional State agencies impacted by your project from which, according to Item VII, Page 3, no comments were solicited. We request that you forward to each of the agencies a Draft Environmental Statement and a request for comments, with a copy to our office.

Stream Control Commission
Robert Al LaFleur
Executive Secretary
P. O. Drawer FC
Baton Rouge, Louisiana 70803

Department of Agriculture
Dave L. Pearce
Commissioner
P. O. Box 44302
Baton Rouge, Louisiana 70804

Department of Conservation
R. T. Sutton
Commissioner
P. O. Box 44275
Baton Rouge, Louisiana 70804

Louisiana Geological Survey
Leo W. Hough
State Geologist
P. O. Drawer G
Baton Rouge, Louisiana 70803

Joint Legislative Committee
on Environmental Quality
Donald J. Whittinghill
Director
P. O. Box 44033
Baton Rouge, Louisiana 70804

Attorney General's Office
Environmental Section
Dick Troy
234 Loyola
New Orleans, Louisiana 70112

Bureau of Environmental Health,
Water, & Air Quality
James Coerver
Director
P. O. Box 60630
New Orleans, Louisiana 70160

Office of State Planning
Patrick W. Ryan
Executive Director
P. O. Box 44425
Baton Rouge, Louisiana 70804

Division of Natural Resources
& Energy
Don Herbert
P. O. Box 44156
Baton Rouge, Louisiana 70804

Response: The following letter was sent to the Executive Director, Commission on Intergovernmental Relations on January 9, 1975:

Please refer to your letter of January 3, 1975.

Draft Environmental Impact Statements were sent to each of the agencies listed on the attachment to your letter when the Environmental Impact Statements were mailed on December 13, 1974. This list of agencies was inadvertently left off the list in Item VII, page 3.

Thank you for calling this to our attention.

Environmental Protection Agency -

Comment: Generally, the Draft Statement addresses many of the project associated impacts. However, we suggest that the Final Statement include a more complete discussion of the impacts of the alteration, modification or reconstruction of existing facilities such as bridges and pipelines. The location of major facility changes, particularly bridge alteration, should be provided. This information would be helpful in evaluating the total impact of the watershed project.

Response: The discussion on bridges, culverts, and pipelines on page 13 of the Environmental Impact Statement and page 71 of the Watershed Work Plan was revised as follows:

Alteration, modification, or reconstruction of some existing facilities such as bridges, culverts, and pipelines will be necessary to insure proper functioning of planned structural measures. The work on the bridges involves the enlargement of the channel cross section by excavating under the bridge, reinforcing one or more bents of pilings, or lengthening a bridge in order to widen the channel. Work on the culverts involves replacing existing culverts with larger ones, lengthening existing culverts, or lowering the grade of existing culverts. Work on the pipelines involves the lowering or casing of existing pipelines. No bridges, culverts, or pipelines will be relocated.

This alteration, modification, or reconstruction includes, but is not limited to, 4 bridges and 25 culverts on State and Federal highways, 80 bridges and 70 culverts on parish and private roads, and pipelines at 30 locations. The work will be done concurrently with channel construction. The specific locations of existing facilities to be altered are shown on the design profiles and cross sections in the working files. Replacement of any State and Federal highway bridges or culverts will be coordinated with the Louisiana Highway Department early in the design phase prior to construction. Designs will be in accordance with current standards for traffic and type of highway.

There are no relocations of residences or businesses required.

Advisory Council on Historic Preservation -

Comment: This is in response to your request of December 13, 1974, for comments on the Draft Environmental Statement (DES)

and Watershed Work Plan (WWP) for the East Franklin Watershed, Louisiana. Pursuant to its responsibilities under Section 102(2)(C) of the National Environmental Policy Act of 1969, the Advisory Council on Historic Preservation has determined that your DES and WWP appear adequate. However, the Council notes on page 83 of the DES and again on page 90 of the WWP that additional cultural surveys are planned and if resources are found that will be impacted, they will either be preserved or salvaged.

The Council wishes to remind Soil Conservation Service (SCS) that if such sites are determined to be eligible for inclusion in the National Register of Historic Places, SCS is required to afford the Council an opportunity to comment in accordance with the "Procedures for the Protection of Historic and Cultural Properties" (36 C.F.R. Part 800). For your information, steps to determine eligibility are set forth in Section 800.4(a)(2) of the Procedures, a copy of which is enclosed for your convenience.

Response: The following sentence is added on page 14 of the Environmental Impact Statement and on page 72 of the Watershed Work Plan. "The Advisory Council on Historic Preservation will be afforded an opportunity to comment if such sites are determined to be eligible for inclusion in the National Register of Historic Places in accordance with the "Procedures for the Protection of Historic and Cultural Properties."

State of Louisiana - Department of Highways -

Comment: We have reviewed a copy of the Draft Environmental Impact Statement on the East Franklin Watershed, Louisiana, No. USDA-SCS-EIS-WS-(ADM)-75-3-(D)-LA and have no comment.

Response: None required.

Department of Health, Education, and Welfare -

Comment: Environmental health program responsibilities and standards of the Department of Health, Education, and Welfare include those vested with the United States Public Health Service and the Facilities Engineering and Construction Agency. The U.S. Public Health Service has those

programs of the Federal Food and Drug Administration, which include the National Institute of Occupational Safety and Health and the Bureau of Community Environmental Management (housing, injury control, recreational health and insect and rodent control).

Accordingly, our review of the Draft Environmental Statement for the project discerns no adverse effects that might be of significance where our program responsibilities and standards pertain, provided that appropriate guides are followed in concert with State, County, and local environmental laws and regulations.

We therefore have no objection to the authorization of this project insofar as our interests and responsibilities are concerned.

Response: None required.

State of Louisiana - Department of Art, Historical, and Cultural Preservation -

Comment: This Department does not know of any sites on the National Register of Historic Places or being actively nominated to the National Register which would be affected by the proposed project.

Response: None required.

United States Department of the Interior - Geological Survey -

Comment: We have reviewed the subject statement and find it to be reasonably adequate and accurate in its evaluation of the impact of the proposed action on the hydrologic environment.

Response: None required.

State of Louisiana - Louisiana Geological Survey -

Comment: We have received the copy of the Draft Environmental Statement on East Franklin Watershed, Louisiana and thank you very much for sending it to us.

Response: None required.

State of Louisiana - Governor's Council on Environmental Quality -

Comment: Soil Conservation Service is to be commended on the detailed documentation supplied. The candid appraisal of adverse environmental impacts, together with discussions of measures to be taken to minimize adverse impacts, allows the review process to be done more thoroughly. It is hoped that future Environmental Impact Statements prepared by the Soil Conservation Service will meet a similar professional standard.

This letter is intended to serve as a negative declaration on the project.

Response: None required.

Department of Transportation - United States Coast Guard -

Comment: The Department of Transportation has reviewed the material submitted. We have no comments to offer nor do we have any objection to this project.

Response: None required.

Louisiana Wildlife and Fisheries Commission -

Comment: We are especially grateful that you have recognized the role of water quality in maintenance of the fresh water fishery found in Bayou Macon "cutoff No. 3."

We are aware that the Soil Conservation Service and the Sponsors have succeeded in reducing damages to fish and wildlife habitat considerably below that anticipated from the original watershed plan.

The Louisiana Wildlife and Fisheries Commission appreciates the opportunities for reviewing this project during the planning states and for commenting on this draft.

Response: None required.

Department of the Army - Office of the Assistant Secretary

Comment: Page 11, 6th subpara. From an environmental standpoint, it may be more desirable not to smooth spoil in forested areas since this may encourage landowners to plant or graze such areas.

Response: The spoil will not be spread and smoothed in forest land so that landowners can cultivate. The spoil will be stacked and shaped into a uniform embankment so that it will be easier to establish vegetation. On page 11, 6th paragraph, 1st line of the environmental impact statement, the word "smoothed" was changed to "shaped." The same change was made on page 68 of the watershed plan.

Comment: Page 13, last para. Location of weirs and permanent water to be created should be shown on a map.

Response: The locations of weirs are shown on the Project Map, Appendix C, of the environmental impact statement and on figure 7 of the watershed plan. Other data on the structures for water control (weirs) are shown on table 3A in the watershed plan.

Comment: Page 15, Land Use Changes. From the table presented, it appears that no additional forest lands will be cleared other than that for right-of-way. This should be verified as most projects of this type result in some induced clearing.

Response: No project-induced clearing was assessed to the project. This is explained on page 70 of the environmental impact statement.

Comment: Page 34, Plant and Animal Resources. Inclusion of data on fishes, benthic invertebrates, and water quality in the streams proposed for alteration would be helpful in assessing impacts on aquatic ecosystems.

Response: This data is presented on pages 31-43 and pages 62-65.

Comment: Page 34, 3d para. The source of data on fish standing crop estimates (for Bayou Macon, Tensas River, and Boeuf River) should be cited. This comment also applies to estimates for lakes, multiple use ponds, and catfish ponds referred to in the proceeding para. Descriptions of species diversity should reference or provide data on relative numbers of individuals of each species rather than generalizations on total numbers of species present.

Page 37, last para. Data on which standing crop estimates and species composition descriptions are based should be included or cited.

Response: Rotenone samples in Bayou Macon Cutoffs No. 2 and 3 were taken in September 1973. It was the judgment of biologists with the Soil Conservation Service and the Louisiana Wild Life and Fisheries Commission that these lakes contained the most significant lake-type fisheries and would produce data representative for the remaining lakes and ponds (excluding the commercial catfish ponds). The standing crops in these two lakes were 195 pounds per acre for Cutoff No. 3 and 293 pounds per acre for Cutoff No. 2. After studying habitat conditions in the remaining multiple use lakes and ponds, it was estimated that all would vary between 195 to 293 pounds per acre found in the two cutoff lakes. Therefore, 225 pounds per acre was assigned to these water bodies. The species composition from the rotenone samples are found on pages 36 and 37. The data on catfish poundage per acre was based on three sources: (1) personal communication with pondowners, (2) Channel Catfish Farming in Louisiana, Wildlife Education Bulletin No. 98. Louisiana Wild Life and Fisheries Commission, (3) Catfish Farming, USDA Farmers Bulletin No. 2244.

Data on fisheries in the outlets and ponded water channels were based on: (1) Rotenone and electroshocking samples taken by Gulf South Research Institute. (This data can be found on pages 235 and 242 of the Environmental Assessment In The Tensas River Basin prepared by Gulf South Research Institute. (2) Electroshocking samples taken by the Soil Conservation Service biologists beginning in 1973, with samples being taken twice yearly. (3) Arthur D. Little's study entitled Channel Modifications on Environmental, Economic and Financial Assessment.

Comment: Page 34, last line. The statement, that the dissolved solids concentrations listed in the table on page 37 are limiting fish production, should be considered. Jenkins (Jenkins, Robert M., 1973, Reservoir Management Prognosis: Migraines or Miracles. Paper presented at Southern Division, American Fisheries Society, Hot Springs, Arkansas, October 15, 1973) has shown that sport fish standing crops are highest in moderately hard waters (i.e. those waters having a range in total dissolved solids concentration of 100-350 ppm). Based on his findings, the dissolved solids concentrations reported for Bayou Macon and the Tensas River are optimal for sport fish production. References should be cited to support the conclusion that such concentrations (for any of the parameters listed) are limiting productivity.

Response: The purpose of the tabulation on page 38 is to show the effects of four water quality parameters in combination could have on the fisheries. It doesn't appear realistic

to single out one parameter, such as dissolved solids, and state that existing concentrations for Bayou Macon and Tensas River are optimal for sport fish production. Rotenone and electrofishing data collected on these areas indicates that both are severely lacking in sport fish production. These samples indicate and verify the fact that one favorable water quality parameter cannot be used to judge a stream's suitability for sport fish.

Additionally, concentrations of dissolved solids may influence the toxicity of heavy metals and organic compounds to fish and other forms of aquatic life. Research indicates that among inland waters in the United States supporting a good, mixed fish fauna, about 5 percent have a dissolved solids concentration under 72 mg/l; about 50 percent under 169 mg/l; and about 95 percent under 400 mg/l. The dissolved solids concentrations listed on page 37, together with the turbidity, suspended solids and color concentrations provide poor water quality for an optimal sport fishery.

Comment: Page 39, 1st para. It would be helpful if location of existing forest lands was shown on a map containing the proposed project features.

Response: The locations of the major forest lands are described on pages 26 and 27 of the ENVIRONMENTAL SETTING.

Comment: Page 71, line 4. The location of the 10,000-acre bottomland forest tract should be included on the project area map.

Response: The locations of the major forested tracts (including the 10,000-acre bottomland forest tract) are described on pages 26 and 27 under the ENVIRONMENTAL SETTING.

Comment: Page 72, top para. As a general rule, improved farming practices do not improve wildlife habitat.

Response: "improve wildlife habitat," was deleted from this sentence on page 71 of the environmental impact statement and page 79 of the watershed work plan.

Comment: Pages 72-75, Erosion and Sediment. The utility of the proposed weirs to fish and wildlife is questioned. These structures are apparently intended to trap sediment rather than provide permanent aquatic habitat. These "pools" will trap 48,240 tons of sediment (page 74) or 84% of the sediment delivered annually by the proposed project channels. Since the pools will average only 1.5 feet deep, it is reasonable to anticipate a complete loss of useful aquatic habitat within a very short period of time. Thereafter, all additional annual sediment will be transported downstream.

Response: It is estimated that weirs will trap approximately 48,240 tons of sediment. This is 26 percent of the amount that would be delivered to outlets by project channels if the weirs were not installed. The plans and computations for excavation include an overcut to store sediment. The impounded water depth shown in the watershed plan and environmental impact statement does not include the overcut provided for sediment storage. The maintenance program as described on pages 17 through 19 of the environmental impact statement and pages 97 through 99 of the watershed plan is adequate to maintain the effectiveness of the weirs.

Comment: Page 78, 2d subpara. The statement that there will be complete recovery of the aquatic biological community one year after construction, is not consistent with published information.

Response: It is recognized that published data from other states gives varying time frames for recoveries of biological communities. For example, Tarplee et al. in an article Evaluation of the Effects of Channelization on Fish Populations in North Carolina's Coastal Plain Streams found that "Fish populations, as represented by species diversity, in a channelized stream may recover to natural levels in approximately 15 years provided no further alterations of the stream bed, bank, forest canopy, or aquatic vegetation occur." Another study by Carl J. Cederholm, The Short Term Physical and Biological Effects of Stream Channelization at Big Beef Creek, Kitsap County, Washington, showed that after two years following stream channelization the coho salmon densities showed signs of recovery. Current literature available to the Soil Conservation Service concerning recovery rates is all from other states under variable conditions of stream flow, fisheries, soil types, and channel work. The 3 miles of ponded water channels in this project are previously modified drainage ditches supporting a fishery composed primarily of commercial species. Because of the existing poor water quality, the limited biota, and previous channel work on these areas, the 1-year recovery rate to these conditions seems realistic. The Soil Conservation Service currently has a monitoring program underway evaluating water quality and fish population changes for preproject and postproject conditions.

Comment: Page 79. The proposed project will permit intensification of farming and will result in increased concentrations of pesticides in its runoff. This will adversely affect the Bayou Macon cutoffs as well as downstream aquatic habitats. This impact of project implementation and its significance should be discussed.

Response: A pesticide monitoring program has been underway since 1973 for these two cutoff lakes. Results thus far indicate these lakes already have residue levels of certain chlorinated hydrocarbons far above the tolerance limits.

Sheet erosion over the entire watershed will be reduced from 4.4 tons per acre per year to 4 tons per acre per year. This is a 9 percent reduction. Sediment being delivered to the outlets and minor streams will be reduced approximately 400,000 tons by project measures during the 10-year project installation period.

A large percentage of pesticides are transported attached to soil particles. Therefore, the reduction in sheet erosion and sediment delivered to channels, will result in a subsequent reduction in pesticides delivered to the subject lakes.

Comment: Page 79, 3d subpara and other paras. If the present world price of soybeans holds up, timber clearing could be resumed.

Response: We agree the statement in this comment is true. However, in this particular area, land use changes have been relatively stable during fluctuating soybean prices and it is anticipated that it will remain in approximately the same land use.

Comment: Page 89. Alternatives. The relative impacts of the various alternatives would be clarified by the inclusion of a summary-type table which would present changes in habitat types, benefits, costs, etc., expected to result from implementation of each alternative considered.

Response: Comparisons are drawn for the various levels of protection in the "Reasons for Selecting Works of Improvement" under the PROJECT FORMULATION section of the watershed plan.

Comment: Page 90, "Change land use . . .", 3d and 4th subparas. If cottonwoods are planted, returns will be much higher and rotations much shorter.

Response: Cottonwoods do not exhibit fast growth on heavy clay or the poorer-drained soils of the Southern Mississippi Valley Silty Uplands. J. S. McKnight states in Forest Service Research paper SO-60 that "Mediocre growth has been observed on Sharkey soils. On soils where mediocre growth is expected, the investment in a cottonwood plantation usually cannot be justified."

U.S. Army Corps of Engineers -

(Response to Narrative in Letter of Comment)

Comment: The outlets for the proposed projects are three streams which have Corps of Engineers projects. Analysis of the channel design of Bayou Boeuf River and Tensas River, below the point where the work plan channels enter, indicates that these channels are adequate to carry the design flow of the proposed works. The channel design of Bayou Macon is inadequate to carry the design flow proposed. The Lake Chicot pumping plant, authorized for construction by the Corps of Engineers in the headwater of Bayou Macon, will reduce stages in Bayou Macon to more than compensate for the increase in flows following construction of the watershed plan. Therefore, we believe that construction of that part of the watershed plan which discharges into Bayou Macon should be deferred until the Lake Chicot pumping plant is put into operation. Construction will take about three years to complete depending on adequate funding.

Response: Page 69 shows stage changes resulting from project installation. The peak stage increases resulting from installation of that portion of the project channels emptying into Bayou Macon show no change except for M-3 which would result in less than 0.1 of foot increase. This small increase will not cause any damages that would necessitate delaying installation of the project channels prior to installation of Corps project.

U.S. Department of the Interior - Office of the Secretary

Comment: The proposed action will not adversely affect any existing or proposed unit of the National Park System nor any historical, natural or environmental education site eligible for registration to the National Landmark Programs.

Response: None required.

Comment: An examination of library and file data, without the benefit of a field investigation, revealed that during 1972 the value of mineral production from the aforementioned parishes was as follows:

| Parish | Value Thousands | Commodities Produced |
|---|---|---|
| Catahoula | $10,943 | Petroleum, sand and gravel, natural gas, stone |
| Franklin | 2,219 | Petroleum, natural gas |
| Richland | 24,597 | Petroleum, natural gas liquids, natural gas |

Known mineral resources within the watershed are limited to oil, gas, sand and gravel, and stone. Both documents acknowledge the existence of mineral resources (work plan, p. 9 and environmental statement, p. 25) and state that "oil, gas, and deposits occur." Neither document describes the effects of such a project on the future development of mineral resources in the area. In addition, neither document discusses the existence of pipelines that traverse the area nor any plans to protect or relocate them.

Response: There are no known mineral deposits in this watershed except the ones mentioned. No existing pipelines are to be relocated.

The proposed structural measures will have no effect on the exploration, production, or future development of mineral resources.

The existence of pipelines that cross project channels have been acknowledged and the need for lowering or casing is discussed on pages 13 and 71 of the environmental impact statement and work plan, respectively.

Comment: The draft environmental impact statement does not adequately address the adverse impacts that can be expected to occur on the fish and wildlife resources within the project area. Approximately 196,000 acres of land will be affected by the proposed project. Of this total, there are approximately 36,900 acres of undeveloped land that provide valuable habitat for many species of wildlife. This project, with its associated land conversions from forest land to intensified agricultural uses, will result in a decrease in the amount of wildlife habitat available with a resultant decrease in wildlife populations.

Response: A thorough and objective study of all elements to be affected by this project does not provide a basis for projecting land conversions from forest land to intensified agricultural uses in excess to that shown in the document.

Comment: It is stated on page 1, paragraph 2, that an increase in wildlife carrying capacity will result on existing forest lands from forest management practices. However, in the same section it is stated that there will be a decrease in forest game habitat. Further explanation is needed to clarify these conflicting statements.

Response: The details of the forest management program are explained under Conservation Land Treatment on page 68. Basically, the program will involve developing management plans on 8,600 acres of existing forest land. A forester will be assigned to the area to guide and provide technical assistance to landowners concerning forest management practices beneficial to wildlife and timber production. The decrease in forest game habitat refers to the 277 acres of hardwoods that will be cleared for rights-of-way purposes. This is explained on page 81.

Comment: Although land conversion may not be encouraged, page 7, paragraph 3, in many instances this is a significant factor in the destruction of valuable woodland wildlife habitat which is becoming scarce within the project area.

Response: We agree with this statement.

Comment: With regard to installation of land treatment measures, the data provided does not show that these measures will actually be installed, page 7, paragraph 4. Although measures may be established because of the financial inducement provided, further explanation is needed to show how these practices will be maintained.

Response: Maintainance of land treatment and structural measures is discussed on pages 17 through 19 of the environmental impact statement and pages 97 through 99 of the watershed plan.

Comment: Habitat enhancement discussed on page 8, paragraph 4, of the statement does not give needed detailed information to properly evaluate these wildlife land treatment measures. Moreover, these measures are usually not a product of completed watershed projects. Therefore, more supportive information is needed as to what will be maintained, created, and improved.

Response: A total of 2,400 acres of wildlife habitat will be retained and created. Seventy acres of habitat improvement such as food plots will be established. The remaining 2,330 acres involves retaining existing wildlife habitat. Forty-two percent, or 1,000 acres, involves retention of valuable wetlands. See page 7, paragraph 4, for the percentages of various land treatment measures that have been installed in five delta watersheds.

Comment: Paragraph 1 on page 12 states that the lower end of certain channels will not be excavated in order that they may act as filters for runoff before entering major streams. Further explanation is needed as to what will be filtered, how effective filtering will be and how these unexcavated channels will reduce adverse downstream effects.

Response: The elimination of excavation on the lower ends of certain channels was a recommendation made by biologists of the U.S. Department of the Interior. Allowing overbank flooding in forested areas filters out sediment and pollutants such as fertilizer nutrients and pesticides, which are attached to these soil particles. The amount of sediment filtered out during these overflow periods is variable depending upon flow, size of the soil particles, duration of flooding, and density of the ground cover through which the water is passing. The undetermined amount of sediment that drops out during the overbank flooding periods will reduce downstream sedimentation and its associated effects.

During the rainfall periods when overbank flooding does not occur, the unexcavated portions will be beneficial because the water velocity will be slowed due to dense vegetation and sediment will drop out. The unexcavated portions will contain more in-channel cover which will aid in filtering out sediment and attached pollutants.

Comment: Paragraph 2 on page 12 implies that certain channels will not be excavated due to their adequacy. However, it should be stated that these same channels will be maintained to insure present flow conditions. Also, it should be stated how they will be maintained and what associated adverse effects this will have on the fish and wildlife resources.

Response: It is stated on page 17 and page 18 that adequate channels will be maintained to insure present flow conditions. "How" the channels will be maintained is also explained on page 17 and page 18. One phase of the maintenance program will be two mechanical cleanouts during the life of the project. The amount of sediment to be removed each time will be small enough to be placed and smoothed on the berm. The associated adverse effects of these cleanouts will be temporary increases of turbidity, a removal of channel cover, and destruction of the benthic community.

Comment: Paragraph 3 on page 12 should include a description of all the acres that are to be disturbed and their relative value to the associated wildlife resources. This should include the 823 acres that are now occupied by channels, berms and spoil.

Response: The 823 acres occupied by channel rights-of-way includes 230 acres of forest land, 395 acres of wooded channel banks, and 198 acres of open land. Game species associated with the forest land and wooded channel banks include white-tailed deer, wild turkey, gray and fox squirrels, and swamp and cottontail rabbits. The open land habitat is utilized by bobwhite quail, mourning doves, and cottontail rabbits. Numerous nongame species of animals also frequent the open land and forest land. The tabulation on page 41 shows the current estimated populations of game species. The tabulation on page 82 shows changes in habitat and number of game animals as a result of project construction.

Comment: The summarized data presented on page 14 is questionable and should be documented as to source so it can be reviewed for accuracy.

Response: Rotenone samples were taken in other areas in the watershed. These data were used as a basis for estimating populations in channels throughout the project area. An electrofishing unit was used to sample the species diversity. Sampling data are shown in tabulations on pages 36 and 37. Commercial species such as buffalo, gar, gizzard shad, catfish, and carp were most numerous.

Comment: The fact that three of the seven miles of ponded water are to be altered is not reflected in the tabulated data, page 14, which shows that acres and standing crop will remain the same after project construction. This contradicts later statements to the effect that biological productivity will be lowered on three miles of ponded water. Also included in this data should be species composition figures.

Response: The fact that 3 of the 7 miles of ponded water channels will be altered is shown on page 9. The tabulated data on page 15 shows that preproject and postproject fish populations in intermittent and ponded water channels will be the same. Under the Environmental Impacts section on page 77 it is stated that a slight lowering of biological productivity will result from construction. However, because of the species currently present in these channels, no reductions in standing crop or species diversity is anticipated. Species composition for these resources are found on pages 34 through 38.

Comment: The seven tested measures listed on page 15 may minimize the adverse effects of the project, but will not in any manner eliminate adverse effects.

Response: We agree with this statement.

Comment: <u>Environmental Setting</u>

This section states that there will be only two channels entering into project lakes. These channels exit into Bayou Macon cutoff Numbers 2 and 3. Due to the fact that 30 percent of the noncommercial fisheries are within these two cutoffs, we believe that the use of the word "only" is inappropriate, page 28, paragraph 2.

Response: The word "only" has been deleted.

Comment: The description represented in the tabulated data, pages 31-34, is inconsistent with Type 1 wetland[1/] which should be stated as seasonally flooded basins and flats. Therefore, the 3,265 acre figure should be expanded to include areas other than "seasonally flooded hardwoods."

Response: The description in USDI Circular No. 39 on page 20 states that Type 1 wetlands are found in overflow bottom lands. The 3,265 acres of Type 1 wetlands shown in the tabulation on page 35 includes all seasonally flooded hardwoods in basins and flats. A large percentage of the total acreage of Type 1 wetlands are associated with the overflow bottom lands of the Tensas River.

Comment: Liters per miligram should be stated as milligrams per liter, tabulated data, page 37. Explanation of the data should explain why the concentrations of dissolved solids are limiting fish production.

Response: The tabulated data on page 38 was changed to read milligrams per liter. Concentrations of dissolved solids may influence the toxicity of heavy metals and organic compounds to fish and other forms of aquatic life. Hart reported that "among inland waters in the United States supporting a good mixed fish fauna, about 5 percent have a dissolved-solids concentration under 72 mg/l; about 50 percent under 169 mg/l; and about 95 percent under 400 mg/l." Dissolved solids include nitrates and phosphates which accelerate eutrophication. The dissolved solids concentrations listed on page 38 , together with the turbidity, suspended solids, and color concentrations, provide poor water quality for a diversified fisheries. Both of the streams, Bayou Macon and Tensas River, have fish populations composed primarily of commercial and rough fish.

Comment: This section states that one channel (M-16) crosses a large forested tract, page 71. We also note that channel M-14 crosses the same large forested tract but is not mentioned in the statement, an explanation is desired.

Response: The discussion of the location of M-14 was omitted in the draft statement. The discussion was revised as follows:

"About 37,000 acres of forest land have been cleared in the last 15 years. The 10,000-acre block of bottom land forest is the only large area remaining that is subject to being cleared and converted to cropland. One project channel is located on the southwest edge and another on the northern edge of this large forested tract. One channel, M-16, enters the tract approximately 0.5 mile from the western edge of the forest land at Louisiana Highway 4 and extends 0.3 mile in a northwesterly direction then 0.5 mile in a westerly direction. The other channel, M-14, enters the tract approximately 1 mile west of the Franklin-Tensas parish line and extends 1.5 miles through the forested tract along a gravel road. No other channels are located . . . . . . . ."

This change was made on page 70 of the environmental impact statement and on page 77 of the watershed plan.

Comment: The statement that no significant land use changes will occur does not explain the possible adverse effects that land use changes in the vicinity of channels M-7 and M-10 could have on the associated valuable wildlife wetland and forest land and habitats, page 79, paragraph 4.

Response: Construction of Channel M-7 will not affect water levels in this wetland. Soil Conservation Service policy prohibits draining Type 5 wetlands. Twenty-seven acres of this wetland is classified as Type 5. Channel designs and subsequent construction will be performed in accordance with Soil Conservation Service policy to prevent altering the water level in the Type 5 wetlands.

The forest land adjacent to Channel M-10 currently has an adequate outlet on the west side. Since an adequate outlet already exists for this area, project-induced clearing could not be assessed to the project.

Comment: The last paragraph on page 79 should explain why there will be no adverse effects on the fisheries. Sedimentation and pesticide runoffs will increase, due to the fact that postproject conditions will be conducive to intensified agricultural use. This situation could further degrade the present aquatic resources.

Response: The discussion on pages 79 is evaluating the effects of the project on Big Lake. The project will not change the drainage area of Big Lake. Agricultural runoff currently entering Big Lake will be the same for preproject and postproject. When the land treatment measures are installed within the drainage area of Channel M-14 system, a reduction in sediment entering Big Lake will occur. Therefore, during the life of the project, water entering Big Lake via Channel M-14 will be improved above existing water quality levels.

Comment: Paragraph 3, page 81 states that a monitoring program has been developed for preproject and postproject water quality conditions. Preproject water quality conditions should be included.

Response: The water quality data for preproject conditions acquired in the monitoring program is shown on page 65.

Comment: It is questionable that mourning dove and bobwhite quail will benefit from land conversion to open land when forested areas to be cleared provide nesting and escape cover, page 82, paragraph 2. With intensive agricultural use of land as a result of project benefits, it is doubtful that any land will revert to brush-type habitat.

Response: The discussion on page 81 is referring specifically to the conversion of forested areas and wooded channel banks to open land "only for channel rights-of-way." It is pointed out that after a period of about 3 years, the open land condition will change to a brush-type habitat, causing its usefulness as feeding areas for doves and quail to diminish.

Comment: An explanation is needed to clarify whether the weir designed for Channel M-20, page 83, paragraph 2, will create ponded water, or if the weir is for the protection of the previously existing 23 acres of Type 5 wetlands[27] If no ponded water is created by this weir, then 27 weirs should be credited with water impounded and not 28 as stated earlier. Acreage adjustments are also needed if the weir in M-20 is credited for ponding previously existing water.

Response: The weir designed for Channel M-20 will create 10 acres of additional ponded water and maintain permanent water on 23 acres of Type 5 wetlands and 147 acres of Type 7 wetlands. As stated in the environmental impact statement, 28 weirs will be installed resulting in creation of 147 additional acres of ponded water.

Comment: Therefore, due to the adverse effects on wildlife resources that are likely to occur within this watershed project area, we recommend the following:

1. That 2,400 acres of land treatment measures be planned in detail in agreement with the Louisiana Wild Life and Fish Commission and project sponsors;

2. That there be some legal binding agreement between the sponsors, construction agency, and the Louisiana Wild Life and Fish Commission to insure the installation of planned land treatment measures for wildlife; and,

3. That every effort be made to insure that the remaining 36,900 acres of forest land not be converted to intensive agricultural use.

Response: The Fish and Wildlife Service of the U.S. Department of the Interior has been involved in the planning of this watershed since its inception. The two previous reports dated February 1970 and October 1974 did not contain the above three recommendations.

A discussion on the installation of land treatment measures is on pages 5, 6, 7, 8, and 9 of the environmental impact statement and on pages 63, 64, 65, 66, and 67 of the watershed work plan.

The Watershed Protection and Flood Prevention Act (68 Stat. 666) authorizes the Secretary of Agriculture to cooperate with local organizations having authority under State law to carry out, maintain, and operate works of improvement for flood prevention or for the conservation, development, utilization, and disposal of water in watershed or subwatershed areas. Federal help under the Act is available only to assist local organizations to plan and install needed water-management and flood prevention measures that cannot feasibly be installed under other current Federal conservation programs. The Soil Conservation Service does enter into agreements with land users individually or collectively to carry out planned land treatment measures. The Soil Conservation Service shall continue to fulfill the spirit and intent of the Act to its fullest extend in order to accomplish the primary mission of this agency; that is, to assist in the conservation, development, and productive use of the Nation's soil and water and related resources.

## APPENDIXES

Approved by Alton Mangum

Alton Mangum
State Conservationist

Date May 23, 1975

APPENDIX A - COMPARISON OF BENEFITS AND COSTS FOR STRUCTURAL MEASURES

East Franklin Watershed, Louisiana

(Dollars)

| Evaluation Unit | Average Annual Benefits 1/ Damage Reduction | More Intensive Land Use | Drainage | Redevelopment | Secondary | Total | Average Annual Cost | Benefit Cost Ratio |
|---|---|---|---|---|---|---|---|---|
| I | 198,300 | 32,800 | 134,500 | 13,700 | 55,000 | 434,300 | 113,900 | 3.8:1 |
| II | 140,400 | 23,800 | 97,700 | 15,700 | 46,700 | 324,300 | 129,500 | 2.5:1 |
| III | 108,200 | 18,300 | 75,100 | 4,700 | 29,300 | 235,600 | 42,300 | 5.6:1 |
| IV | 110,100 | 19,500 | 80,100 | 5,800 | 27,300 | 242,800 | 48,200 | 5.0:1 |
| Project Administration | xxx | xxx | xxx | xxx | xxx | xxx | 25,200 | xxx |
| GRAND TOTAL | 557,000 | 94,400 | 387,400 | 39,900 | 158,300 | 1,237,000 | 359,100 | 3.4:1 |

1/ Price base 1974 current normalized prices.

May 1974

## APPENDIX B

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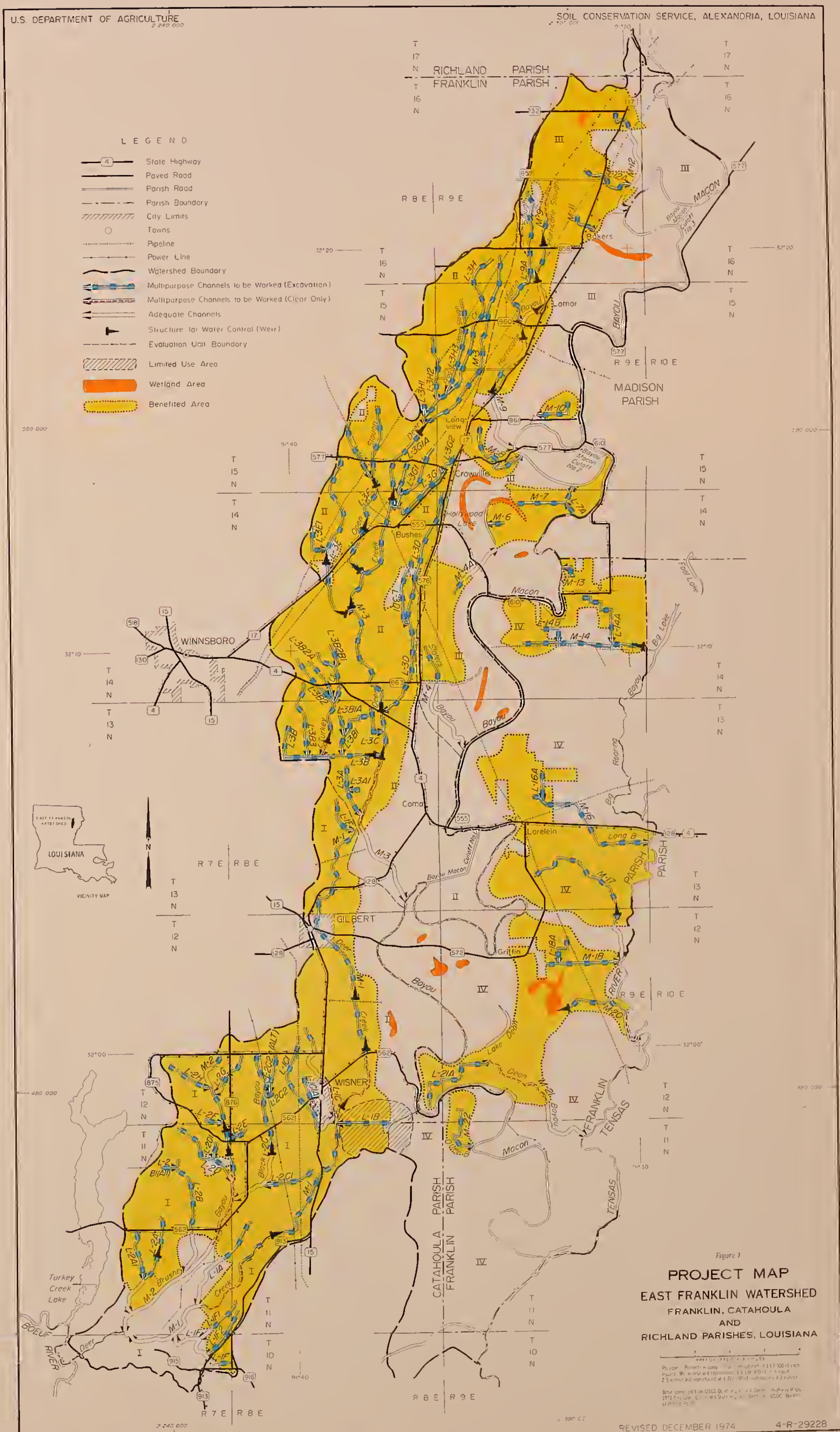


Figure 7

PROJECT MAP
EAST FRANKLIN WATERSHED
FRANKLIN, CATAHOULA
AND
RICHLAND PARISHES, LOUISIANA

Appendix C

APPENDIX D

# INTERPRETATIONS OF WATER QUALITY PARAMETERS

## CHLORIDE (Cl)

Water quality is dependent upon the use(s) of the water. The following data is not all inclusive but summarizes water quality criteria for some common uses.

Chloride is found in natural waters. It may originate from natural mineral origin or from (1) seawater contamination of underground water supplies, (2) salts spread on roads and bridges, (3) human or animal sewage, and (4) industrial effluents such as those from paper works, water softening plants, oil wells, and petroleum refineries. It is recommended that the chloride concentration not exceed a monthly average of 125 mg/l and that the maximum concentration not exceed 250 mg/l. The primary concern in setting these standards is economic damage rather than public health. For public supplies, water with a chloride concentration of less than 125 mg/l is rated "acceptable"; between 125 and 250 mg/l "doubtful"; and over 250 mg/l "unsatisfactory." For industrial use, the corresponding limits are: less than 50 mg/l, 50-175 mg/l, and over 175 mg/l, respectively.

"The Aquatic Life Advisory Commission of ORSANCO concluded that it is impossible to generalize on the effects of chloride concentrations on aquatic life, because each mixture of chlorides with other salts must be evaluated separately. Hart, et al., cite data indicating that among U.S. waters supporting a good fish fauna, ordinarily the concentration of chlorides is below 3 mg/l in 5 percent; below 9 mg/l in 50 percent; and below 170 mg/l in 95 percent of such waters."[1/]

In summary, it appears that the following chloride concentrations will not normally be deleterious to the specified use: (1) Domestic water supply, 125 mg/l; (2) Industrial water supply, 50 mg/l; (3) Irrigation water, 100 mg/l; and (4) Stock and wildlife, 1,500 mg/l.

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1/ Jack Edward McKee and Harold W. Wolf, Water Quality Criteria, publication No. 3-A, (2nd edition; Sacramento: State Water Quality Board, 1963) p. 161.

## COLOR (APPARENT)

Color of natural waters is derived from substances in solution or from materials in colloidal state.2/ The standard unit used to measure color is the amount of color produced by adding 1 mg/l of platinum to water. Results are expressed as units of color. "Color in excess of 50 units may limit photosynthesis and have a deleterious effect upon aquatic life, particularly phytoplankton and the benthos."3/

## DISSOLVED SOLIDS

Water without some dissolved solids does not occur in nature and will not support aquatic life. Natural water contains an endless variety of dissolved materials in concentrations that will vary widely from place to place and from time to time. Some commonly occurring dissolved solids are: carbonates; bicarbonates; chlorides; sulfates; phosphates; nitrates of calcium, magnesium, sodium, and potassium; and traces of iron, manganese, and other elements. Many of these dissolved solids are essential to aquatic organisms for their growth, reproduction, and general well-being. All dissolved solids, which are necessary to aquatic organisms, have a range of concentrations that are both essential and tolerable. The tolerance levels for any one dissolved solid varies depending on the concentrations and kinds of other substances present. In general, the concentrations of dissolved materials in natural freshwaters are below the optimum for maximum productivity. In many instances, the addition of any of a large number of substances would be beneficial. However, the addition of what may be considered a beneficial substance must be planned and controlled so that it will not exceed favorable limits.4/ It is believed that the total dissolved solids in a water course should not be increased more than one-third of the concentration it has under natural conditions.

Dissolved solids may influence the toxicity of heavy metals and organic compounds to fish and other forms of aquatic life. This is a

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2/ George K. Reid, Ecology of Inland Waters and Estuaries, (New York: Reinhold Publishing Corporation, 1961), p. 101.

3/ U.S. Department of the Interior, Federal Water Pollution Control Administration, Water Quality Criteria, (Washington: U.S. Government Printing Office, 1972), p. 48.

4/ Ibid., p. 39.

result primarily of the counteracting effect of hardness producing metals. "It has been reported that among inland waters in the United States supporting a good mixed fish fauna, about 5 percent have a dissolved solids concentration under 72 mg/l, about 50 percent under 169 mg/l, and about 95 percent under 400 mg/l."5/

In summary, based on a literature review, dissolved solids up to the following limits should not interfere with the indicated use: (1) Domestic water supply, 1,000 mg/l; (2) Irrigation water, 700 mg/l; (3) Stock and wildlife water, 2,500 mg/l; and (4) Freshwater fish and aquatic life, 2,000 mg/l.

## HARDNESS

Hardness or calcium carbonate determinations are made with the Titration Method and expressed as mg/l. "In natural waters, hardness is a characteristic of water which represents the total concentration of just the calcium and magnesium ions expressed as calcium carbonate."6/ Hardness in water may be caused by the natural accumulation of salts from contact with soil and geological formations, or it may enter from direct pollution by industrial wastes. Hardness of waters is not considered a problem for fisheries in Louisiana. As a guide interpreting hardness, less than 40 mg/l is considered soft water 90-150 mg/l is medium, while above 150 mg/l is considered hard water.

## NITROGEN, AMMONIA ($NH_3$)

Nitrogen is present in natural waters in the form of an inorganic compound such as ammonia. Nitrogen, (ammonia) determination are made by the Nessler method and expressed in mg/l. The chemical state of nitrogen is dependent on the overall limnological conditions of the waterway since nitrogen, (ammonia) is quite unstable. In most freshwaters, the concentrations of this inorganic compound are relatively slight, but nevertheless, very important in determining the productivity of a given community. "Rivers known to be unpolluted have low ammonia concentrations, generally less than 0.2 mg/l as N." 7/

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5/ McKee and Wolf, *op. cit.*, p. 183.

6/ U.S. Department of the Interior, Federal Water Pollution Control Administration, *Chemical Analysis for Water Quality*, 1967, p. 18-1.

7/ McKee and Wolf, *op. cit.*, p. 132.

APPENDIX D

## NITROGEN, NITRATE ($NO_3$)

Nitrogen, (nitrate) determinations are made by the Cadmium Reduction Method and expressed in mg/l. "Nitrogen, (nitrate) usually occurs in relatively small concentrations in unpolluted freshwater, the world average being 0.30 ppm."[8/] Under normal conditions, the amount of nitrate in solution at a given time is determined by metabolic processes in the body of water, i.e., production and decomposition of organic matter. High nitrate concentrations in effluents and water stimulate the growth of plankton and aquatic weeds. By increasing plankton growth and the development of fish food organisms, nitrates indirectly foster increased fish production.

"Hart, et al., report references to the effect that among United States' waters supporting a good fish life, ordinarily 5 percent have less than 0.2 mg/l of nitrates; 50 percent have less than 0.9 mg/l; and 95 percent have less than 4.2 mg/l."[9/]

## OXYGEN (DISSOLVED) ($O_2$)

The dissolved oxygen content can be determined with a Hach Dissolved Oxygen test kit and expressed in mg/l. The content of dissolved oxygen in the water depends on several factors such as the temperature and salinity of the water, amount of organic material present, light present, and the abundance of phytoplankton. "For a diversified warm-water biota, including game fish, dissolved oxygen concentrations should be above 5 mg/l, assuming normal seasonal and daily variations are above this concentration. Under extreme conditions, however, they may range between 5 and 4 mg/l for short periods during any 24-hour period, provided that the water quality is favorable in all other respects."[10/]

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8/ Reid, op. cit., p. 187

9/ McKee and Wolf, op. cit., p. 225.

10/ U.S. Department of the Interior, Federal Water Pollution Control Administration, Water Quality Criteria, (Washington: U.S. Government printing Office, 1972), p. 44.

APPENDIX D

## OXYGEN SATURATION (Percent)

Water is said to be saturated with oxygen when it contains all the dissolved oxygen it can hold at a given atmospheric pressure, temperature, and dissolved solids concentration. The difference between the actual oxygen content and the amount that could be present is called the saturation deficit. If the water contains more oxygen than should normally be present, it is said to be supersaturated. The ability of water to hold oxygen decreases with increases in temperature, dissolved solids, and reduction of atmospheric pressure.[11/] Natural waters are seldom at equilibrium or exactly saturated with dissolved oxygen. The reason for this is that temperatures and atmospheric pressure are always changing and physical, chemical, bio-chemical, and/or biological activities are continually utilizing or producing dissolved oxygen.

Oxygen saturation, like pH and alkalinity, is only a measurement, but it indicates the amount of potential oxygen actually present. High or low oxygen saturation values usually indicate high or low concentrations of dissolved oxygen, but this is not always the case. For instance, seawater at 15 degrees centigrade and 100 percent saturation will contain only 6 ppm dissolved oxygen while freshwater at 15 degrees centigrade and 100 percent saturation will contain 11 ppm dissolved oxygen.[12/]

In natural waters, oxygen saturation is usually between 70 and 120. Reading below this range usually indicates pollution which is utilizing the available oxygen and/or inhibiting the biological production of additional oxygen. Readings above this range usually come in mid to late afternoon on warm, sunny days, and indicate excessive photosynthetic activity by green plants in the water.

## pH

The pH can be determined with a Hach test kit. The symbol "pH" is used to designate the logarithm (base 10) of the reciprocal of the hydrogen-ion concentration. If the value is less than 7, then the pH is considered acid and the lower the number the more acid. Values above 7 indicate a basic solution with the larger number being more

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11/ Charles W. Keenan and Jesse H. Wood, General College Chemistry (2nd ed.; New York, Evanston, London: Harper and Row, Publishers, 1957).

12/ George K. Reid, Ecology of Inland Waters and Estuaries (New York: Reinhold Publishing Corporation, 1961).

basic. "In most productive, fresh, natural water, the pH falls in the range between 6.5 and 8.5 (except when increased by photosynthesis activity)."13/ "Bass and bluegill can live from 4.6 to 11; growth and reproduction at either extreme is poor. The optimum level for growth for these fish is 6.5 to 8.5."14/

## PHOSPHATE, ORTHO ($PO_4$)

The Orthophosphate determinations were made by the Ascorbic Acid Method which gives a reading in mg/l. This is a test for just orthophosphates and does not indicate total phosphate content. The major sources of phosphorus entering freshwaters are domestic sewage effluents (including detergents), animal and plant processing wastes, fertilizer and chemical manufacturing spillage, various industrial effluents, and to a limited extent, sediment materials in agricultural runoff. "Phosphorus is stored in plankton and bottom sediments. Very little of this stored phosphorus reenters the water. Evidence from the addition of fertilizers to fish ponds and from what is known about the eutrophication of lakes by sewage supports the view that phosphorus plays a major role in production."15/ "Most natural waters contain relatively low levels of phosphorus (0.01 to 0.05 mg/l) in the soluble state during periods of significant productivity."16/ "Optimum growth of all organisms studies in cultures can be obtained on concentrations from 0.09 to 1.8 mg/l of phosphorus while a limiting effect on all organisms will occur in phosphorus concentrations from 0.009 mg/l downward. The lower limit of optimum range of phosphorus concentration varies from about 0.018 to about 0.09 mg/l; and the upper limit from 8.9 to 17.8 mg/l."17/

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13/ U.S. Department of the Interior, Federal Water Pollution Control Administration, Water Quality Criteria, (Washington: U.S. Government Printing Office, 1972), p. 40.

14/ U.S. Department of Agriculture, Soil Conservation Service, "Water Quality and Fish Culture," Biology Technical Note XII, 1968.

15/ U.S. Department of the Interior, Federal Water Pollution Control Administration, The Practice of Water Pollution Biology, Division of Technical Support, 1969, p. 40.

16/ U.S. Department of the Interior, Federal Water Pollution Control Administration, Chemical Analysis for Water Quality, 1967, p. 15-1.

17/ S.P. Chu, "The Influence of the Mineral Composition of the Medium on the Growth of Planktonic Algae," Journal of Ecology, 31(2), 1943, pp. 109-148.

## SODIUM (Na)

Sodium is a very active metal which does not occur free in nature. Nevertheless, sodium compounds make up 2.8 percent of the earth's crust. Most sodium salts are extremely soluble in water. Because of this, any sodium that is leached from soil or discharged into streams by industries will normally remain in solution. Sodium is the cation of many salts used in industry and is one of the most common ions in process wastes.

Sodium in drinking water may be harmful to people suffering from cardiac, renal, and circulatory diseases. Drinking water of good quality may contain up to 115 mg/l of sodium, but it is recommended that a limit of 10 mg/l be established for drinking water and 50 mg/l for industrial water. Water used by livestock and wildlife should not have sodium concentrations greater than 2,000 mg/l.

"Of the United States' waters supporting a good fish fauna, originally the concentration of sodium plus potassium is less than 6 mg/l in about 5 percent, less than 10 mg/l in about 50 percent, and less than 85 mg/l in about 95 percent."[18/]

## SPECIFIC CONDUCTANCE

Specific conductance is an indication of the ion concentration in water. Natural freshwater usually contains relatively small amounts of ions in solution, but in water polluted by brines and various chemical wastes the ion concentration may rise to levels that are harmful to living organisms because of the increase in osmotic pressure.

All substances in solution collectively exert osmotic pressure on the organisms living in it. Most aquatic species can tolerate some changes in the amount of ions naturally present if the total maximum concentration is not exceeded. Wide variations in total salinity (specific conductance) or in the concentration of individual salts can have profound effects upon the aquatic fauna, resulting in the elimination of some or all aquatic species. When the osmotic pressure is sufficiently high because of ions in solution (high specific conductance), water will be drawn from the gills and other delicate external tissues causing considerable damage or even death. High concentrations of many types of pollutants of freshwater present this danger apart from any other toxic or corrosive effects they may have.[19/]

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18/ McKee and Wolf, op. cit., p. 259.

19/ Ibid., p. 94.

"Ellis has concluded that conductances in excess of 1,000 mhos x $10^{-6}$ at 25 degrees centigrade in most types of streams are probably indicative of the presence of acid or salt pollution of various kinds. Ellis has also found that a specific conductance of 4,000 x $10^{-6}$ mhos at 25 degrees centigrade is approximately the upper limit of ionizable salts tolerated by fish.

Using Ellis' data, Hart, et al., have reported that among United States' waters supporting a good fish fauna, about 5 percent have a specific conductance under 50 x $10^{-6}$ mhos at 25 degrees centigrade, about 50 percent under 270 x $10^{-6}$ mhos, and about 95 percent under 1,100 x $10^{-6}$ mhos."20/

## SULFATE ($SO_4$)

Sulfate content can be analyzed by the Turbidimetric Method and expressed in mg/l. Sulfates occur naturally in waters as a result of leachings from gypsum and other common minerals. "Sulfate is ecologically important in natural waters in several ways. It is apparently necessary for plant growth; short supply of the material can inhibit the development of phytoplankton populations and, therefore production. Sulfur is important in protein metabolism and is supplied to the organism originally as sulfate."21/ "In United States waters that support good game fish populations, 5 percent of the waters contain less than 11 mg/l of sulfates, 50 percent less than 32 mg/l, and 95 percent less than 90 mg/l. Experiments indicate that water containing less than 0.5 mg/l of sulfate will not support growth of algae."22/

## SULFIDE (S)

Sulfides are determined by the Methylene Blue Method and expressed in mg/l. Sulfides in water are a result of the natural processes of decomposition, sewage, and industrial wastes such as those from oil refineries, tanneries, pulpmills, papermills, textile mills, chemical plants, and gas manufacturing facilities.

"The toxicity of solutions of sulfides toward fish increase as the pH value is lowered, i.e., the $H_2S$ or HS, rather than the sulfide ion, appears to be the toxicity principle."23/ "Concentrations in the

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20/ Ibid., p. 274.

21/ George K. Reid, op. cit., p. 195.

22/ McKee and Wolf, op. cit., p. 276.

23/ Ibid., p. 277.

range of less than 1.0 mg/l to 25.0 mg/l are lethal in 1 to 3 days to freshwater fish."[24/]

## SUSPENDED SOLIDS

Suspended solids consist normally of sediment, organic detritus, bacteria, and plankton in natural waters. The standard method of determining the suspended solids content of a water source is by use of the Photometric Method which gives a direct reading of mg/l of suspended solids. The test is not intended to measure the concentrations of specific chemical substances in water, but rather give an empirical estimate of water quality by measuring the amount of suspended foreign materials present. Suspended solids may kill some species of fish and shellfish if exposed to concentrations of 100-200 mg/l for long-term periods.[25/]

## TEMPERATURE

Temperature is an important, and sometimes critical water quality parameter. Water temperature changes can result from natural climatic phenomena or from man's activities. For instance, "stream temperatures may be increased by irrigation practices and the return of agricultural drainage."[26/]

Water temperature changes resulting from man's activities are generally upward. Increases in temperature usually cause some or all of the following: (1) lowers the solubility of dissolved oxygen, thereby reducing the availability of this essential gas, (2) higher temperatures increase the rate of metabolism and respiration and thus the oxygen demand of fish and other aquatic life; therefore, the oxygen demand is increased while the oxygen supply is decreased, (3) intensifies the toxicity of many substances, (4) higher temperatures favor the growth of sewage fungus and the putrefaction of sludge deposits which is detrimental to desirable fishes, (5) there is a maximum and minimum temperature that each species can tolerate; therefore, changes in temperature may cause a change in species composition; (fish tolerance to temperature extremes and changes vary with fish species, prior acclimatization, oxygen availability, and the synergistic effects of other pollutants) and (6) changes in

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24/ U.S. Department of the Interior, Federal Water Pollution Control Administration, Water Quality Criteria, (Washington: U.S. Government Printing Office, 1972), p. 88.

25/ McKee and Wolf, *op. cit.*, p. 280.

26/ *Ibid.*, p. 283.

temperature also affects lower aquatic life. Temperature is one of the environmental features that determines which organisms will thrive, diminish, or be eliminated.[27]

To maintain a well-rounded warm-water fishery population, the following recommendations were made on temperature extremes and temperature increases.

1. "During any month of the year, heat should not be added to a stream in excess of the amount that will raise the temperature of the water (at the expected minimum daily flow for that month) more than 5 degrees Fahrenheit. In lakes and reservoirs, the temperature of the epilimnion should not be raised more than 3 degrees Fahrenheit above that which existed before the addition of heat of artificial origin. The increase should be based on the monthly average of the maximum daily temperature.

2. The normal daily and seasonal temperature variations that were present before the addition of heat, because of other than natural causes, should be maintained.

3. The recommended maximum allowable temperatures are not to exceed the maximum temperatures of the preferred fish species and their associated biota."[28]

## TOTAL ALKALINITY

Alkalinity is not a specific polluting substance, but rather a combined effect of several substances and conditions. It is actually a measurement of the power of a solution to neutralize hydrogen ions. It is usually expressed in terms of an equivalent amount of calcium carbonate, $CaCO_3$. Alkalinity is caused by the presence of carbonates, bicarbonates, hydroxides, and to a lesser extent by borates, silicates-phosphates, and organic substances. Total alkalinity is related to pH but high pH values do not necessarily mean high total alkalinity values. High total alkalinity values indicate a buffered water which would be resistant to rapid, wide changes in pH. For instance, water with a pH of 7.0 can have a low total alkalinity value, whereas a buffered water with a pH of 6.0 can have a higher total alkalinity value.

Alkalinity itself is not considered harmful to humans but it is usually associated with high pH, hardness, and excessive dissolved

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27/ Ibid., p. 285.

28/ U.S. Department of the Interior, Federal Water Pollution Control Administration, Water Quality Criteria, (Washington: U.S. Government Printing Office, 1972), p. 42.

solids, all of which may be harmful. For industrial use, high total alkalinity can be either beneficial or detrimental depending upon the type of industry.

Water to be used by livestock and wildlife for drinking should have a total alkalinity below 170 mg/l. Animals drinking water with higher values develop diarrhea. For fish and other aquatic life, alkalinity is not lethal to fully developed fish if the concentration is not enough to raise the pH well above 9.0.

The best waters for supporting a productive, diversified fish population and other aquatic life are those with pH values between 7 and 8 and having a total alkalinity of 120 mg/l or more. This alkalinity acts as a buffer to help prevent sudden changes in pH which could be harmful to fish and other aquatic life.[29/]

For waterfowl, waters with relatively high bicarbonate alkalinity produce more high value food plants than those with low such values. "Few waters with less than 25 mg/l bicarbonate alkalinity can be classed among the better waterfowl habitat."[30/] Bicarbonate increases the amount of $CO_2$ available for plant use in photosynthesis.

## TURBIDITY

Turbidity is the term used to describe the degree of translucence produced in water by suspended particulate matter. Excessive turbidity reduces light penetration into the water and, therefore, reduces photosynthesis by phytoplankton organisms, attached algae, and submersed vegetation. Turbidity calibrations were originally based on the Jackson Candle Turbidimeter with results expressed in Jackson Turbidity Units (JTU). As the Jackson equipment lacks sensitivity below 25 JTU (most treated water ranges from 0 to 5 JTU), the meter scale calibrations have been based on a uniform milky polymer called formazin, which allows accurate calibrations over a wide range. The results are expressed as Formazin Turbidity Units (FTU) and are equivalent to the Jackson Units. According to Buck "maximum production of 161.5 lbs/acre occurred in farm ponds where the average turbidity was less than 25 FTU. Between 25 and 100 FTU fish yield dropped 41.7 percent to 94 lbs/acre, and in muddy ponds where turbidity exceeded 100 FTU, the yield was only 29.3 lbs/acre, or 18.2 percent of clear ponds."[31/]

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29/ McKee and Wolf, op. cit., p. 129.

30/ U.S. Department of the Interior, Federal Water Pollution Control Administration, Water Quality Criteria, (Washington: U.S. Government Printing Office, 1972), p. 94.

31/ Ibid., p. 46.

# APPENDIX E COMMON AND SCIENTIFIC NAMES OF ANIMALS MENTIONED IN THIS REPORT

The animals are listed alphabetically by the common name followed by the scientific name.

## BIRDS

Bachman's warbler
*Vermivora bachmanii*

Barred owl
*Strix varia*

Belted kingfisher
*Megaceryle alcyon*

Blue jay
*Cyanocitta cristata*

Blue-winged teal
*Anas discors*

Bobwhite quail
*Colinus virginianus*

Brown thrasher
*Toxostoma rufum*

Common crow
*Corvus brachyrhynchos*

Downy woodpecker
*Dendrocopos pubescens*

Eastern bluebird
*Sialia sialis*

Eastern meadowlark
*Sturnella magna*

Gadwall
*Anas strepera*

House sparrow
*Passer domesticus*

Little-blue heron
*Florida caerulea*

Louisiana heron
*Hydranassa tricolor*

Mallard
*Anas platyrhynchos*

Mourning dove
*Zenaidura macroura*

Osprey
*Pandion haliaetus*

Pileated woodpecker
*Dryocopus pileatus*

Pintail
*Anas acuta*

Red-headed woodpecker
*Melanerpes erythrocephalus*

Red-shouldered hawk
*Buteo lineatus*

Red-tailed hawk
Buteo jamaicensis

Screech owl
Otus asio

Southern bald eagle
Haliaeetus leucocephalus

Wild turkey
Meleagris gallopavo

Wood duck
Aix sponsa

Yellow-crowned night heron
Nyctanassa violacea

## MAMMALS

Beaver
Castor canadensis

Black bear
Ursus americanus

Bobcat
Lynx rufus

Cotton mouse
Peromyscus gossypinus

Cotton rat
Sigmodon hispidus

Cottontail rabbit
Sylvilagus floridanus

Fox squirrel
Sciurus niger

Gray Fox
Urocyon cinereoargenteus

Gray Squirrel
Sciurus carvolinensis

Mink
Mustela vison

Nine-banded armadillo
Dasypus novemcinctus

Nutria
Myocastor coypus

Opossum
Didelphis virginiana

Raccoon
Procyon lotor

Striped skunk
Mephitis mephitis

Swamp rabbit
Sylvilagus aquaticus

White-tailed deer
Odocoileus virginianus

## AMPHIBIANS AND REPTILES

Alligator snapping turtle
Macroclemys temmincki

American alligator
Alligator mississippiensis

Bullfrog
Rana catesbeiana

Canebrake rattlesnake
Crotalus horridus atricaudatus

Chicken turtle
Deirochelys reticularia

Common snapping turtle
Chelydra serpentina

Copperhead
Agkistrodon contortrix contortrix

Eastern garter snake
Thamnophis sirtalis sirtalis

Eastern glass lizard
Ophisaurus ventralis

Five-lined skink
Eumeces fasciatus

Green anole
Anolis carolinensis

Ground skink
Lygosoma laterale

Kingsnake
Lampropeltis getulus holbrooki

Rat snake
Elaphe obsoleta obsoleta

Red-eared turtle
Pseudemys scripta elegans

Smooth softshell turtle
Trionyx muticus

Southern leopard frog
Rana pipiens sphenocephala

Stinkpot turtle
Sternothaerus adoratus

Western cottonmouth
Agkistrodon piscivorous leucostoma

## FISHES

Alligator gar
Lepisosteus spatula

Black bullhead
Ictalurus melas

Black crappie
Pomoxis nigro maculatus

Blue catfish
Ictalurus furcatus

Bluegill
Lepomis macrochirus

Buffalo
Ictiobus spp.

Carp
Cyprinus carpio

Chain pickerel
Esox niger

Channel catfish
Ictalurus punctatus

Gizzard shad
Dorosoma cepedianum

Golden shiner
Notemigonus crysoleucas

Green sunfish
Lepomis cyanellus

Largemouth bass
Micropterus salmoides

Pirate perch
Aphredoderus sayanus

Redear sunfish
Lepomis microlophus

Spotted sucker
Minytrema melanops

Spotted sunfish
Lepomis punctatus

Tadpole madtom
Noturus gyrinus

Threadfin shad
Dorosoma petenense

Warmouth
Lepomis gulosus

White crappie
Pomoxis annularis

# APPENDIX F

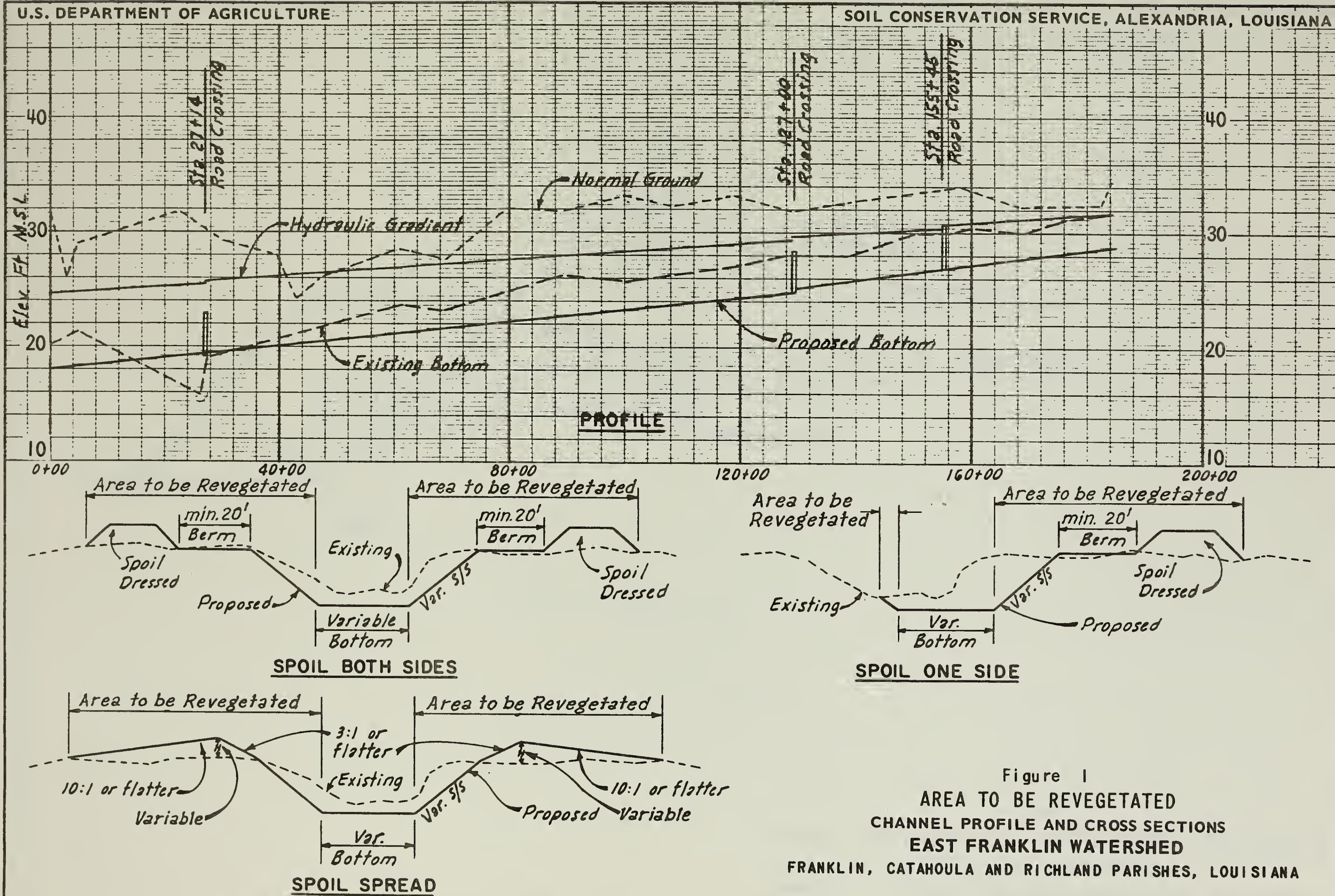



Figure I
AREA TO BE REVEGETATED
CHANNEL PROFILE AND CROSS SECTIONS
EAST FRANKLIN WATERSHED
FRANKLIN, CATAHOULA AND RICHLAND PARISHES, LOUISIANA

REVISED DECEMBER 1974 4-R-33666

USDA-SCS-FORT WORTH, TEX. 1974

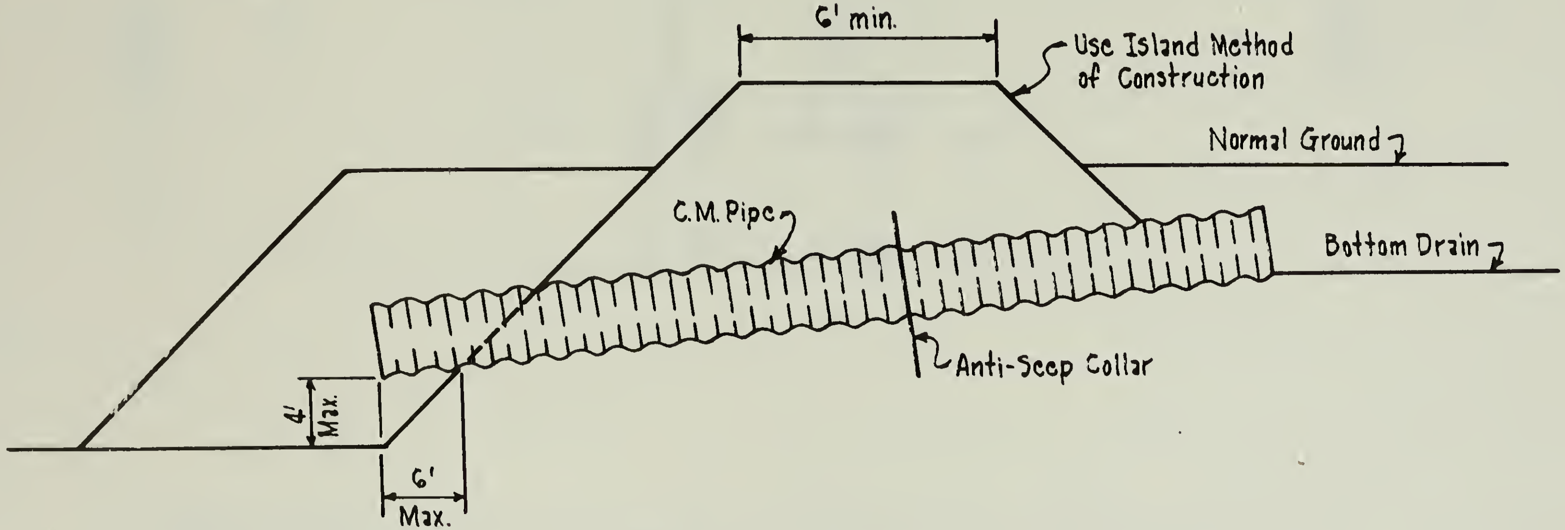



Figure 2

TYPICAL STRUCTURE FOR WATER CONTROL (PIPE DROP)

**EAST FRANKLIN WATERSHED**

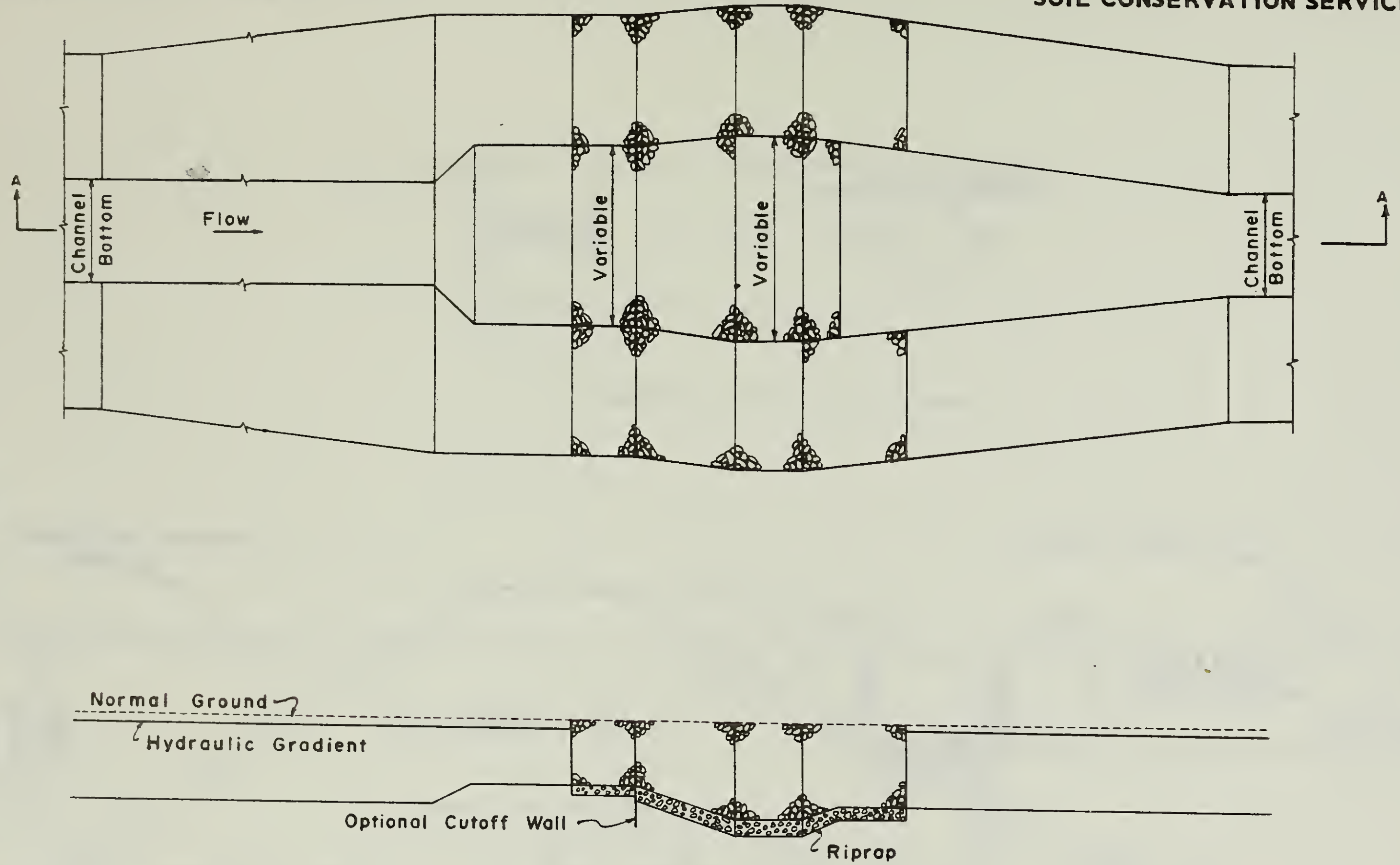
FRANKLIN, CATAHOULA AND RICHLAND PARISHES, LOUISIANA

MARCH 1974 4-R-33767

USDA-SCS-FORT WORTH, TEX. 1974

U.S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE, ALEXANDRIA, LOUISIANA




SECTION A-A

Figure 3

TYPICAL STRUCTURE FOR WATER CONTROL (WEIR)

**EAST FRANKLIN WATERSHED**

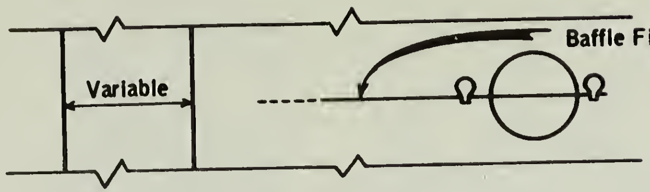
FRANKLIN, CATAHOULA AND RICHLAND PARISHES, LOUISIANA

MAY 1974 4-R-33768

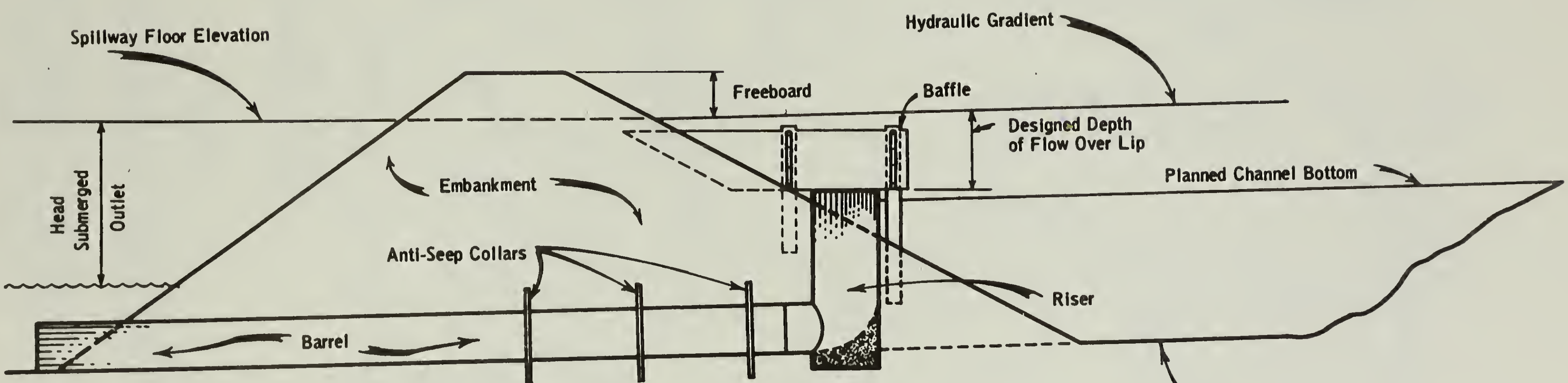
USDA SCS FORT WORTH TEX 1974

U.S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE, ALEXANDRIA, LOUISIANA




PLAN VIEW OF BAFFLE AND RISER




SECTION VIEW

Figure 4

GRADE STABILIZATION STRUCTURE

**EAST FRANKLIN WATERSHED**

FRANKLIN, CATAHOULA AND RICHLAND PARISHES, LOUISIANA

MARCH 1974 4-R-33769

USDA-SCS-FORT WORTH, TEX. 1974

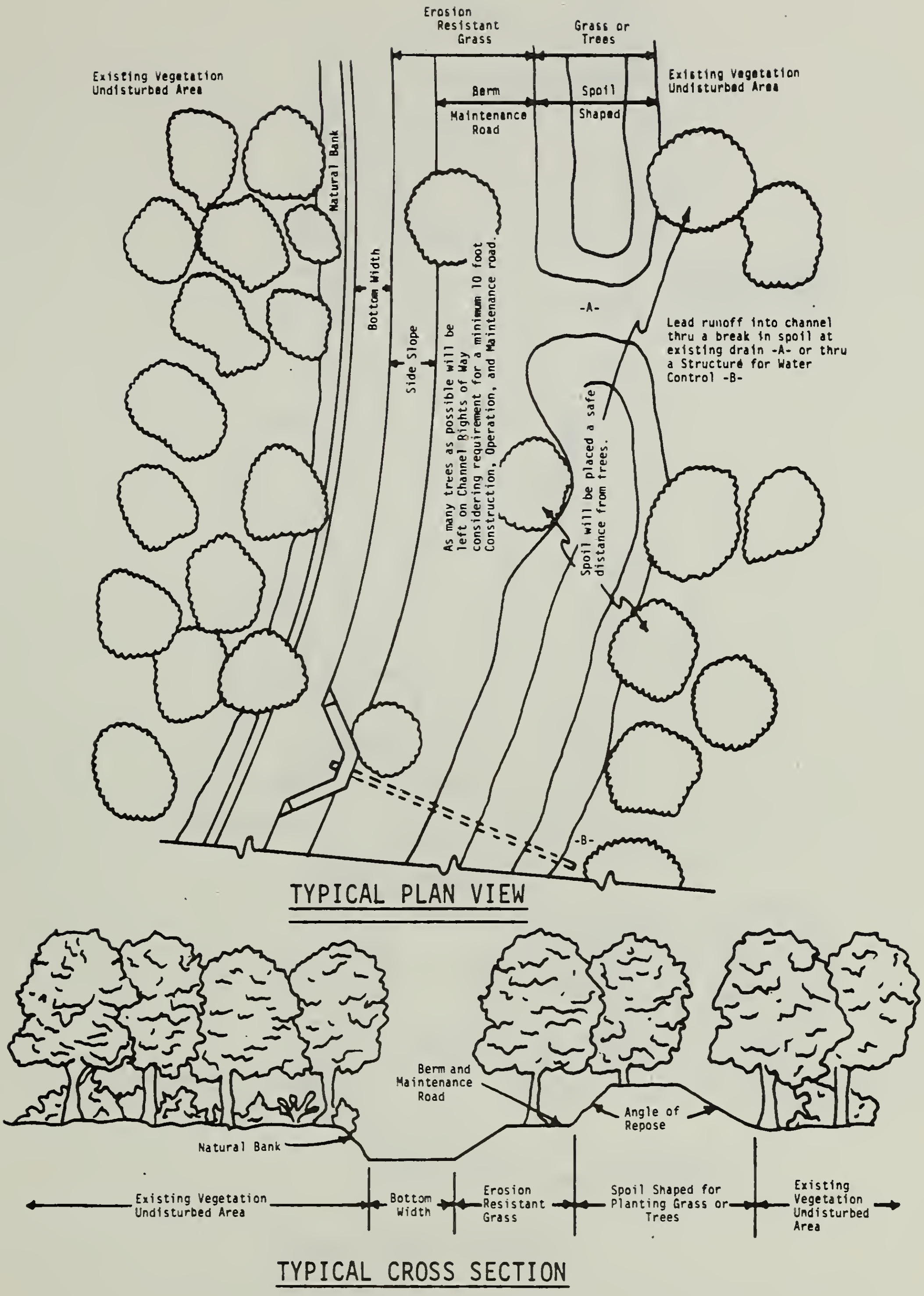
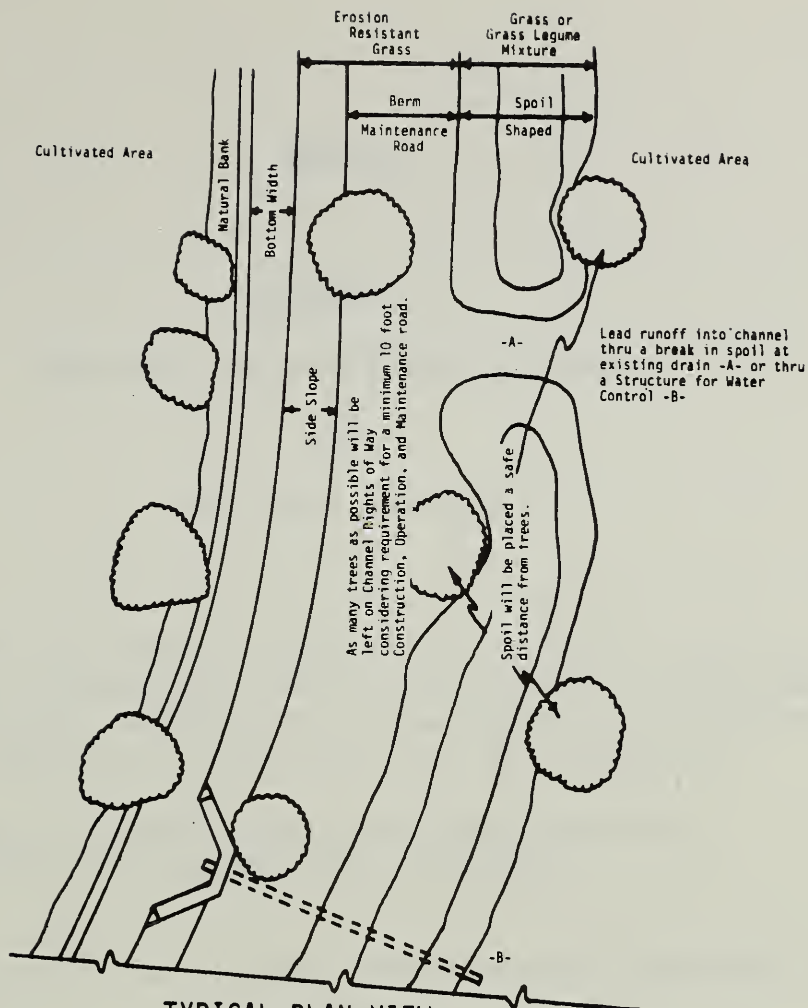


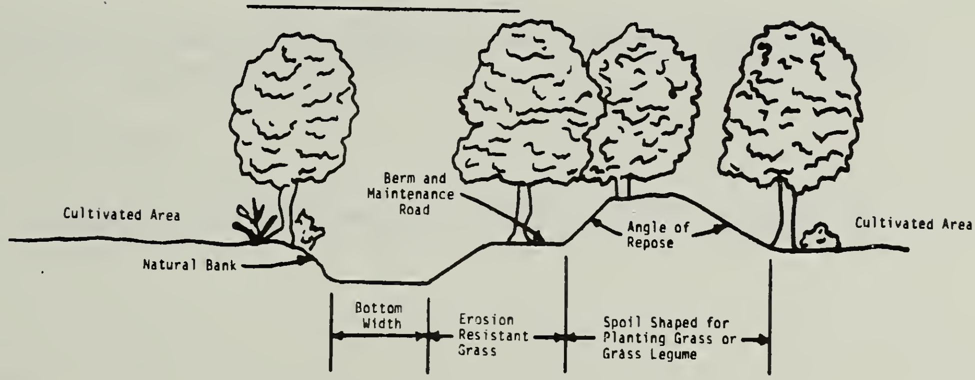

FIGURE 5

TYPICAL PLAN VIEW AND CROSS SECTION
OF CHANNELS THROUGH FOREST LAND

EAST FRANKLIN WATERSHED
Franklin, Catahoula and Richland
Parishes, Louisiana




TYPICAL PLAN VIEW




TYPICAL CROSS SECTION

FIGURE 6

TYPICAL PLAN VIEW AND CROSS SECTION OF CHANNELS WHERE WOODY VEGETATION EXISTS ADJACENT TO CULTIVATED AREA

EAST FRANKLIN WATERSHED
Franklin, Catahoula and Richland Parishes, Louisiana

EXAMPLE

APPENDIX G

OPERATION AND MAINTENANCE AGREEMENT

FOR

STRUCTURAL MEASURES

________________________________________________PROJECT

THIS AGREEMENT made and entered into the _____ day of ______________,19__ is between the Soil Conservation Service, United States Department of Agriculture, hereinafter referred to as the "Service," and the following organizations(s), hereinafter referred to as the Sponsor(s):

Show name(s) of Sponsoring Local Organization(s) responsible for operation and maintenance

The measures covered by this Operation and Maintenance Agreement are identified as:

Invididually name and identify the work of improvement listed in the Work Plan.

As an example:

All multiple-purpose channels listed in the Watershed Work Plan.

A. OPERATIONS

1. The Sponsor will be responsible for and will operate or have operated without cost to the Service the structural measures in compliance with any applicable Federal, State, and local laws, and in a manner that will assure that the structural measures will serve the purpose for which installed as set forth in the Work Plan.

2. The Service will, upon request of the Sponsor and to the extent that its resources permit, provide consultative assistance in the operation of the structural measures.

B. MAINTENANCE

1. The Sponsor will:

   a. Be responsible for and promptly perform or have performed without cost to the Service except as provided in Paragraph C, Establishment Period, all maintenance of the structural measures determined by either the Sponsor or the Service to be needed.

   b. Obtain prior Service approval of all plans, designs, and specifications for maintenance work involving major repair.

2. The Service will, upon request of the Sponsor and to the extent that is resources will permit, provide consultive assistance in the preparation of plans, designs, and specification for needed repair of the structural measures.

C. ESTABLISHMENT PERIOD

1. During an Establishment Period, as herein defined, the Service will bear such part of the cost of any needed major repairs to the structural measures, including associated vegetative work, as is proportionate to the original construction costs borne by the Service in the construction of the structural measures except that the Service will not bear any of the cost for:

   a. Repairs to channels or portions thereof which do not have permanent linings such as concrete, riprap, or grouted rock.

   b. Repairs determined by the Service to have been occasional by improper operation or maintenance, or both.

   c. Repairs that are mutually determined by the Sponsor and the Service as being items of normal maintenance rather than major repair and are not therefore in keeping with the spirit and intent of the Establishment Period provisions.

2. The Establishment Period for structural measures (exclusive of any associated vegetative work) is a period of 3 years ending at midnight on the third anniversary of the date on which the structural measure is accepted.

3. The Establishment Period for vegetative work associated with a structural measure is a period from date of acceptance of the initial vegetative work to midnight of the date on which the Service writes the Sponsor advising that an adequate

vegetative cover has been obtained. However, this period shall not exceed two growing seasons or the end of the Establishment Period for the associated structural measure whichever is greater in time.

4. As used in the two preceding paragraphs, and elsewhere in this Agreement, the following words have the meanings described below:

   ACCEPTED, ACCEPTANCE: The date structural or vegetative measures are accepted from the contractor when a contract is involved, or the date structural or vegetative measures are completed to the satisfaction of the Service when force account operations are involved.

   ADEQUATE VEGETATIVE COVER: A minimum of seventy percent (70%) evenly distributed cover of the desirable species, with no active rilling that cannot be controlled by the vegetation.

5. Major repair may involve such things as (1) replacing significant backfill around structures resulting from major erosion damage, (2) major revegetation due to failure to obtain an adequate vegetative cover, (3) restoring areas with significant erosion, and (4) removing trash and debris from bridges, culverts, and fence crossings.

6. No action with respect to needed repairs during the Establishment Period will be taken by the Sponsor or the Service which would lessen or adversely affect any legal liability of any contractor or his surety for payment fo the cost of the repairs.

## D. INSPECTIONS AND REPORTS

1. During the Establishment Period the Sponsor and the Service will jointly inspect the structural measures at least annually and after unusually severe floods or the occurrency of any other unusual condition that might adversely affect the structural measures. It is desirable the annual inspections be performed during the month shown below. Any supplemental inspections then determined necessary will be scheduled and agreed to at that time.

   ______________________________
   (Month)

2. After the Establishment Period, the structural measures will be inspected annually by the Sponsor, preferably during the month shown below, and after unusually severe floods or the occurrence of any other unusual condition that might adversely affect the structural measures.

   ______________________________
   (Month)

3. After the Establishment Period, the Service may inspect the structural measures at any reasonable time.

4. A written report will be made of each inspection. The report of joint inspections will be prepared by the Sponsor with the assistance of the Service. A copy of each report will be provided by party preparing the report to the other party within 10 days of the date on which the inspection was made.

E. RECORDS

The Sponsor will maintain in a centralized location a record of all inspections performed both individually and jointly by the Sponsor and the Service, and of all significant actions taken by the Sponsor with respect to operation and maintenance. The Service may inspect these records at any reasonable time.

F. GENERAL

1. The Sponsor will:

   a. Prohibit the installation of any structures or facilities that will interfere with the operation or maintenance of the structural measures.

   b. Obtain prior Service approval of the plans and specifications for any alteration or improvement to the structural measures.

   c. Obtain prior Service approval of any agreement to be entered into with other parties for the operation or maintenance of all or any part of the structural measures, and provide the Service with a copy of the agreement after it has been signed by the Sponsor and the other party.

2. Service personnel will be provided the right of free access to the structural measures at any reasonable time for the purpose of carrying out the terms of this agreement.

3. The responsibilities of the Sponsor under this agreement are effective simultaneously with the acceptance of the works of improvement in whole or in part.

G. SPECIAL PROVISIONS

An Operation and Maintenance (O&M) Plan will be prepared for each structure or channel (or similar groups of structures or channels) listed on page one of this agreement at the time of advertisement for bids for such structures or channels. Such O&M plans will be made a part of this agreement.

H. AUTHORIZATION

Name of Sponsor ______________________________________________

By ____________________________ Title ______________________________

This action was authorized at an official meeting of the Sponsor named immediately above on _______________ at _______________________

Attest ____________________________________ Title ____________________

Name of Sponsor ______________________________________________

By ____________________________ Title ______________________________

This action was authorized at an official meeting of the Sponsor named immediately above on _______________ at _______________________

Attest ____________________________________ Title ____________________

Soil Conservation Service, United States Department of Agriculture

By ____________________________ Title ______________________________

OPERATION AND MAINTENANCE PLAN
(CHANNELS)

These channels have been designed and constructed to provide flood protection and drainage for the surrounding lands. This will be accomplished if the channel dimensions are not reduced and the flow of water is not obstructed by trees, brush, weeds, cross fences, and heavy trash. For example, a moderately heavy growth of 2-year old willows in the channel could cut the planned capacity by 50 percent or more. The same is true for equivalent growths of cotton-woods, alders, and water-loving plants such as cattails.

Another important feature of the channel job is the service road along the banks. It is essential that this road be passable with maintenance equipment at all times.

Many of the things required to keep the channel in good working condition could be called routine maintenance which is really nothing more than "normal good car." This includes:

1. Control of brush and weeds. Removal of willows, cottonwoods, alders, the larger woody-stemmed weeds and water plants is a yearly job. They may need attention twice a year in those years when conditions are unusually favorable for rapid regrowth. The job of control more than doubles with the age of the plants. As an example, the difficulty and cost of killing 2-year old willows can be about four times as difficult and costly as killing them in the early seedling stage. In addition the 2-year old and older willows tend to block the channel even after they are killed.

   Spraying, chopping, or mowing are all effective ways of getting rid of brush and weeds. Remember, the service road and the berms need attention the same as the channel.

   The kinds of brush that are likely to give the most trouble are blackwillow, buttonbush, cottonwood, and sycamore.

   The best time to spray is about the time the brush becomes full-leaved.

   CAUTION: If herbicides are handled or applied improperly or if unused portions are not disposed of safely, they may be injurous to humans, domestic animals, desirable plants, fish or other wildlife and they may contaminate water supplies. Drift from aerial spraying can contaminate nearby crops and other vegetation. Follow the directions and heed all precautions on the container label.

2. Keep fences and water gaps in good condition. Look them over after each bank-full flow. Replace missing staples and posts; replace broken wire.

3. Maintain side inlet structures and bridges. Replace any soil that washes from around the metal pipes under the service road.

4. Remove sediment deposits as soon as possible after they are formed. If allowed to remain they not only reduce the size of the channel, they provide good sites for willows and other brush to get a foothold. They may also divert the flow and cause erosion of the channel banks.

APPENDIX H

CHANNEL WORK BY REACHES

| Channel | Station | Inventory of Channel Work 1/ Type of Work | Type Chan. Before Proj. | Flow Cond. Before Proj. |
|---|---|---|---|---|
| M-1 | 1240+80 | II | N | E |
| | 700+00 | II | N | E |
| | 574+73 | IV | M | E |
| | 570+00 | II | M | E |
| | 481+48 | II | M | I |
| | 250+00 | II | N | I |
| | 180+00 | IV | N | I |
| | 140+00 | VI | N | I |
| | 0+00 | VI | N | S |
| L-1A | 194+00 | II | M | E |
| | 80+00 | II | M | E |
| | 0+00 | VI | M | E |
| L-1B | 78+00 | II | M | E |
| | 0+00 | II | M | E |
| L-1C | 172+85 | II | M | E |
| | 140+00 | II | M | E |
| | 72+63 | VI | M | E |
| | 9+00 | IV | M | E |
| | 0+00 | VI | M | E |
| L-1C1 | 202+00 | II | M | E |
| | 39+08 | II | M | E |
| | 0+00 | VI | M | E |
| L-1C1A | 43+55 | II | M | E |
| | 17+94 | II | M | E |
| | 0+00 | IV | M | E |
| L-1E | 73+88 | II | M | E |
| | 10+75 | II | M | E |
| L-1F | 157+07 | II | M | E |
| | 119+42 | II | M | E |
| | 113+68 | IV | M | E |
| | 36+00 | VI | M | E |

1/ See Attached "Coding System for Inventory of Channel Work"

APPENDIX H

CHANNEL WORK BY REACHES

| Channel | Station | Inventory of Channel Work 1/ Type of Work | Type Chan. Before Proj. | Flow Cond. Before Proj. |
|---|---|---|---|---|
| L-1F1 | 98+50 | II | M | E |
| | 23+00 | II | M | E |
| | 0+00 | VI | M | E |
| L-1F2 | 98+79 | II | M | E |
| | 0+00 | II | M | E |
| M-2 | 541+12 | II | M | E |
| | 516+90 | II | M | E |
| | 481+30 | VI | M | E |
| | 314+00 | II | M | E |
| | 200+00 | IV | M | I |
| | 90+00 | VI | M | I |
| | 0+00 | VI | M | S |
| L-2A | 206+00 | II | M | E |
| | 97+00 | II | M | E |
| | 0+00 | VI | M | E |
| L-2A1 | 82+39 | II | M | E |
| | 4+50 | II | M | E |
| | 0+00 | VI | M | E |
| L-2B | 225+00 | II | M | E |
| | 64+92 | II | M | E |
| | 0+00 | VI | M | E |
| L-2B1(Alt.) | 28+00 | II | O | E |
| | 2+50 | II | O | E |
| | 0+00 | II | N | E |
| L-2C | 270+96 | II | M | E |
| | 110+00 | II | M | E |
| | 0+00 | VI | M | E |
| L-2C1 | 85+63 | II | M | E |
| | 0+00 | II | M | E |

1/ See Attached "Coding System for Inventory of Channel Work"

APPENDIX H

CHANNEL WORK BY REACHES

| Channel | Station | Inventory of Channel Work 1/ Type of Work | Type Chan. Before Proj. | Flow Cond. Before Proj. |
|---|---|---|---|---|
| L-2C2 | 11+00 | II | M | E |
| | 0+00 | II | M | E |
| L-2C2(Alt.) | 63+62 | II | M | E |
| | 0+00 | II | M | E |
| L-2D | 130+00 | II | M | E |
| | 8+00 | II | M | E |
| | 0+00 | VI | M | E |
| L-2D1 | 29+68 | II | M | E |
| | 0+00 | II | M | E |
| L-2E | 35+00 | II | M | E |
| | 6+25 | II | M | E |
| | 0+00 | VI | M | E |
| L-2F | 31+50 | II | M | E |
| | 0+00 | II | M | E |
| L-2G | 81+69 | II | M | E |
| | 10+00 | II | M | E |
| | 0+00 | VI | M | E |
| L-2H | 84+88 | II | M | E |
| | 0+00 | II | M | E |
| M-3 | 1130+50 | II | M | E |
| | 570+40 | II | M | E |
| | 263+00 | II | M | I |
| | 65+00 | VI | M | I |
| | 43+00 | IV | M | I |
| | 0+00 | VI | M | I |
| L-3A | 91+00 | II | M | E |
| | 0+00 | II | M | E |
| L-3A1 | 18+00 | II | M | E |
| | 0+00 | II | M | E |

1/ See Attached "Coding System for Inventory of Channel Work"

APPENDIX H

CHANNEL WORK BY REACHES

| Channel | Station | Inventory of Channel Work 1/ | | |
|---|---|---|---|---|
| | | Type of Work | Type Chan. Before Proj. | Flow Cond. Before Proj. |
| L-3B | 196+93 | II | M | E |
| | 0+00 | II | M | E |
| L-3B1 | 78+00 | II | M | E |
| | 0+00 | II | M | E |
| L-3B1A | 35+00 | II | O | E |
| | 0+00 | II | O | E |
| L-3B2 | 175+25 | II | N | E |
| | 86+00 | II | N | E |
| | 0+00 | II | M | E |
| L-3B2A | 55+00 | II | M | E |
| | 0+00 | II | M | E |
| L-3B2B | 100+00 | II | M | E |
| | 0+00 | II | M | E |
| L-3B2B1 | 40+00 | II | M | E |
| | 0+00 | II | M | E |
| L-3B3 | 125+00 | II | M | E |
| | 0+00 | II | M | E |
| L-3C | 40+00 | II | M | E |
| | 0+00 | II | M | E |
| L-3D | 312+00 | II | M | E |
| | 0+00 | II | M | E |
| L-3D1 | 109+00 | II | M | E |
| | 0+00 | II | M | E |
| L-3E | 287+60 | II | M | E |
| | 0+00 | II | M | E |
| L-3E1 | 55+00 | II | M | E |
| | 0+00 | II | M | E |

1/ See Attached "Coding System for Inventory of Channel Work"

APPENDIX H

CHANNEL WORK BY REACHES

| Channel | Station | Inventory of Channel Work 1/ Type of Work | Type Chan. Before Proj. | Flow Cond. Before Proj. |
|---|---|---|---|---|
| L-3F | 261+35 | II | M | E |
| | 0+00 | II | M | E |
| L-3F1 | 99+00 | II | M | E |
| | 0+00 | II | M | E |
| L-3G | 134+30 | II | M | E |
| | 0+00 | II | M | E |
| L-3G1 | 109+00 | II | M | E |
| | 0+00 | II | M | E |
| L-3G1A | 55+00 | II | M | E |
| | 0+00 | II | M | E |
| L-3G2 | 45+00 | II | M | E |
| | 0+00 | II | M | E |
| L-3H | 283+55 | II | M | E |
| | 0+00 | II | M | E |
| L-3H1 | 25+00 | II | M | E |
| | 0+00 | II | M | E |
| L-3H2 | 102+35 | II | M | E |
| | 0+00 | II | M | E |
| L-3H3 | 143+00 | II | M | E |
| | 0+00 | II | M | E |
| M-4 | 202+00 | II | M | E |
| | 147+00 | II | M | E |
| | 25+00 | VI | M | E |
| | 0+00 | VI | M | E |
| M-4A | 300+00 | II | N | E |
| | 335+85 | II | N | E |
| | 408+35 | VI | N | E |

1/ See Attached "Coding System for Inventory of Channel Work"

APPENDIX H

CHANNEL WORK BY REACHES

| Channel | Station | Inventory of Channel Work 1/ | | |
|---|---|---|---|---|
| | | Type of Work | Type Chan. Before Proj. | Flow Cond. Before Proj. |
| M-6 | 30+00 | II | M | E |
| | 0+00 | II | M | E |
| M-7 | 110+00 | II | M | E |
| | 39+60 | II | M | E |
| | 0+00 | II | N | E |
| M-7A | 25+00 | II | O | E |
| | 0+00 | II | O | E |
| M-8 | 130+00 | II | M | E |
| | 62+00 | II | M | E |
| | 0+00 | II | N | E |
| M-9 | 487+10 | IV | M | E |
| | 435+40 | IV | M | E |
| | 334+50 | II | M | E |
| | 158+25 | VI | M | E |
| | 95+00 | II | M | E |
| | 0+00 | VI | N | E |
| L-9A | 234+00 | II | N | E |
| | 67+70 | II | N | E |
| | 0+00 | II | M | E |
| M-10 | 101+00 | II | O | E |
| | 59+00 | II | O | E |
| | 0+00 | II | N | E |
| M-11 | 50+00 | II | M | E |
| | 30+00 | II | M | E |
| | 0+00 | II | N | E |
| M-12 | 233+70 | II | N | E |
| | 150+00 | II | N | E |
| | 72+00 | VI | N | E |
| | 0+00 | VI | N | S |

1/ See Attached "Coding System for Inventory of Channel Work"

APPENDIX H

CHANNEL WORK BY REACHES

| Channel | Station | Inventory of Channel Work 1/ Type of Work | Type Chan. Before Proj. | Flow Cond. Before Proj. |
|---|---|---|---|---|
| L-12A | 105+00 | II | M | E |
| | 70+00 | II | M | E |
| | 0+00 | II | N | E |
| M-13 | 45+00 | II | M | E |
| | 0+00 | II | M | E |
| M-14 | 210+60 | II | O | E |
| | 73+00 | II | O | E |
| | 53+00 | II | M | E |
| | 32+00 | II | O | E |
| | 23+00 | II | M | E |
| L-14A | 100+00 | II | M | E |
| | 0+00 | II | M | E |
| L-14B | 50+00 | II | O | E |
| | 0+00 | II | O | E |
| M-16 | 196+00 | II | N | E |
| | 0+00 | II | N | E |
| M-17 | 269+44 | II | M | E |
| | 50+00 | II | M | E |
| | 0+00 | VI | N | E |
| M-18 | 115+00 | II | M | E |
| | 0+00 | II | M | E |
| L-18A | 40+00 | II | M | E |
| | 0+00 | II | M | E |
| M-20 | 138+50 | II | N | S |
| | 73+00 | II | N | S |
| | 18+40 | II | N | E |
| | 0-61+60 | VI | N | E |
| M-21 | 240+00 | IV | M | E |
| | 121+00 | IV | M | E |
| | 0+00 | VI | N | E |

1/ See Attached "Coding System for Inventory of Channel Work"

APPENDIX H

CHANNEL WORK BY REACHES

| Channel | Station | Inventory of Channel Work 1/ | | |
|---|---|---|---|---|
| | | Type of Work | Type Chan. Before Proj. | Flow Cond. Before Proj. |
| M-21A | 143+00 | II | M | E |
| | 0+00 | II | M | E |
| M-22 | 101+00 | II | M | E |
| | 20+00 | II | M | E |
| | 0+00 | II | N | E |

1/ See Attached "Coding System for Inventory of Channel Work"

## Coding System for Inventory of Channel Work

| | | |
|---|---|---|
| Type of Work | I - | establishment of new channel including necessary stabilization measures |
| | II - | enlargement or realignment of existing channel or stream |
| | III - | cleaning out natural or manmade channel (includes bar removal and major clearing and snagging operation) |
| | IV - | clearing and removal of loose debris within channel section |
| | V - | stabilization, by continuous treatment or treatment of localized problem areas, as primary purpose (present capacity adequate) |
| | VI - | adequate |
| Type of channel Prior to Project | N - | an unmodified, well-defined natural channel or stream |
| | M - | manmade ditch or previously modified channel |
| | O - | none or practically no defined channel |
| Flow Condition Prior to Project | Pr - | perennial - flows at all times except during extreme drought |
| | I - | intermittent - continuous flow through some seasons of the year but little or no flow through other seasons |
| | E - | ephemeral - flows only during periods of surface runoff |
| | S - | ponded water with no noticeable flow, caused by lack of outlet or high ground-water level |

# APPENDIX I

Letters of Comment Received on the
Draft Environmental Statement

# Louisiana Forestry Commission

*James E. Mixon, State Forester*

P. O. Box 1628

Baton Rouge, Louisiana 70821


COOPERATION - PL-566 - East Franklin Watershed

January 6, 1975

Mr. Alton Mangum
State Conservationist
Soil Conservation Service
P. O. Box 1630
Alexandria, Louisiana 71301

Dear Mr. Mangum:

This is to advise that we have no objections to the Envoronmental Impact Statement for the East Franklin Watershed.

There is no doubt, however, that once the project is completed the rate of conversion of the remaining forest acreage to crop and pastureland will no doubt be accelerated.

B. F. GRIFFIN - ASSISTANT CHIEF, FOREST MANAGEMENT
DY
CC: Mr. Duane Routh, USFS
Mr. Dewitt H. Braud, Jr., Environmental Coordinator

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
REGION SIX
750 Florida Boulevard
Baton Rouge, Louisiana 70801

January 6, 1975

IN REPLY REFER TO

East Franklin Watershed

Mr. Alton Mangum
State Conservationist
Soil Conservation Service
P. O. Box 1630
Alexandria, Louisiana 71301

Dear Mr. Mangum:

Your December 13, 1974 letter, transmitted a copy of the draft environmental statement for our review.

We note that you have added in the statement provisions for coordinating the construction phase for replacement of highway bridges and culverts with the Louisiana Department of Highways. This work should be coordinated with them early in the design phase of the project. Other than this, we have nothing to add to our October 3, 1974 letter.

Thank you for the opportunity for review of the statement.

Sincerely yours,

Mitchell P. Smith

for M. C. Reinhardt
Division Engineer

# STATE OF LOUISIANA

COMMISSION ON INTERGOVERNMENTAL RELATIONS

EDWIN EDWARDS
GOVERNOR
SENATOR MICHAEL H. O'KEEFE
CHAIRMAN
LEON TARVER
EXECUTIVE DIRECTOR

P O BOX 44455
BATON ROUGE, LOUISIANA 70804
389-5664


January 3, 1975

Mr. Alton Mangum
State Conservationist
Soil Conservation Service
U. S. Department of Agriculture
P. O. Box 1630
Alexandria, Louisiana 71301

Dear Mr. Mangum:

We have reviewed the Draft Environmental Impact Statement for the East Franklin Watershed with respect to agency impact and responsibility.

Enclosed herewith is a list of additional State agencies impacted by your project from which, according to Item VII, Page 3, no comments were solicited. We request that you forward to each of the agencies a Draft Environmental Statement and a request for comments, with a copy to our office.

Please feel free to contact this office if further assistance is required.

Sincerely,

DeWitt H. Braud, Jr.
Environmental Coordinator

DHB:amb

Enclosure

Stream Control Commission
Robert A. LaFleur
Executive Secretary
P.O. Drawer FC
Baton Rouge, LA 70803

Department of Agriculture
Dave L. Pearce
Commissioner
P.O. Box 44302
Baton Rouge, LA 70804

Department of Conservation
R. T. Sutton
Commissioner
P.O. Box 44275
Baton Rouge, LA 70804

Louisiana Geological Survey
Leo W. Hough
State Geologist
P.O. Drawer G
Baton Rouge, LA 70803

Joint Legislative Committee on
Environmental Quality
Donald J. Whittinghill
Director
P.O. Box 44033
Baton Rouge, LA 70804

Attorney General's Office
Environmental Section
Dick Troy
234 Loyola
New Orleans, LA 70112

Bureau of Environmental Health, Water
& Air Quality
James Coerver
Director
P.O. Box 60630
New Orleans, LA 70160

Office of State Planning
Patrick W. Ryan
Executive Director
P.O. Box 44425
Baton Rouge, LA 70804

Division of Natural Resources & Energy
Don Herbert
P.O. Box 44156
Baton Rouge, LA 70804

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VI
1600 PATTERSON
DALLAS, TEXAS 75201

January 24, 1975

Mr. Alton Mangum
State Conservationist
Soil Conservation Service
P. O. Box 1630
Alexandria, Louisiana 71301

Dear Mr. Mangum:

We have reviewed the Draft Environmental Impact Statement, East Franklin Watershed, Catahoula, Franklin, and Richland Parishes, Louisiana. The proposed project provides for watershed protection, flood prevention and drainage in a three parish area. The project will include work on 186 miles of channels (180 miles previously modified drainage ditches), construction of 28 structures for water control, and measures to minimize adverse effects to fish and wildlife.

Generally, the draft statement addresses many of the project associated impacts. However, we suggest that the final statement include a more complete discussion of the impacts of the alteration, modification or reconstruction of existing facilities such as bridges and pipelines. The location of major facility changes, particularly bridge alteration, should be provided. This information would be helpful in evaluating the total impact of the watershed project.

We are classifying the draft statement as LO-1. Specifically, we have no objections to the action as described in the statement at this time. We also believe that your agency has presented an adequate discussion of the impacts of the proposed project and the alternatives available. The classification and the date of our comments will be published in the Federal Register in accordance with our responsibility to inform the public of our views on proposed Federal actions, under Section 309 of the Clean Air Act.

Definitions of the categories are provided on the attachment. Our procedure is to categorize our comments on both the environmental consequences of the proposed action and on the adequacy of the impact statement at the draft stage, whenever possible.

We appreciate the opportunity to review the Draft Environmental Impact Statement. Please send us two copies of the Final Environmental Impact Statement at the same time it is sent to the Council on Environmental Quality.

Sincerely yours,

Arthur W. Busch
Regional Administrator

Enclosure

## ENVIRONMENTAL IMPACT OF THE ACTION

LO - Lack of Objections

EPA has no objections to the proposed action as described in the draft impact statement; or suggests only minor changes in the proposed action.

ER - Environmental Reservations

EPA has reservations concerning the environmental effects of certain aspects of the proposed action. EPA believes that further study of suggested alternatives or modifications is required and has asked the originating Federal agency to re-assess these aspects.

EU - Environmentally Unsatisfactory

EPA believes that the proposed action is unsatisfactory because of its potentially harmful effect on the environment. Furthermore, the Agency believes that the potential safeguards which might be utilized may not adequately protect the environment from hazards arising from this action. The Agency recommends that alternatives to the action be analyzed further (including the possibility of no action at all).

## ADEQUACY OF THE IMPACT STATEMENT

Category 1 - Adequate

The draft impact statement adequately sets forth the environmental impact of the proposed project or action as well as alternatives reasonably available to the project or action.

Category 2 - Insufficient Information

EPA believes the draft impact statement does not contain sufficient information to assess fully the environmental impact of the proposed project or action. However, from the information submitted, the Agency is able to make a preliminary determination of the impact on the environment. EPA has requested that the originator provide the information that was not included in the draft statement.

Category 3 - Inadequate

EPA believes that the draft impact statement does not adequately assess the environmental impact of the proposed project or action, or that the statement inadequately analyzes reasonably available alternatives. The Agency has requested more information and analysis concerning the potential environmental hazards and has asked that substantial revision be made to the impact statement. If a draft statement is assigned a Category 3, no rating will be made of the project or action, since a basis does not generally exist on which to make such a determination.

Advisory Council
On Historic Preservation

Mr. Alton Mangum
State Conservationist
Soil Conservation Service
U. S. Department of Agriculture
P. O. Box 1630
Alexandria, Louisiana 71301

FEB 10 1975

Dear Mr. Mangum:

This is in response to your request of December 13, 1974, for comments on the draft environmental statement (DES) and Watershed Work Plan (WWP) for the East Franklin Watershed, Louisiana. Pursuant to its responsibilities under Section 102(2)(C) of the National Environmental Policy Act of 1969, the Advisory Council on Historic Preservation has determined that your DES and WWP appear adequate. However, the Council notes on page 83 of the DES and again on page 90 of the WWP that additional cultural surveys are planned and if resources are found that will be impacted, they will either be preserved or salvaged.

The Council wishes to remind Soil Conservation Service (SCS) that if such sites are determined to be eligible for inclusion in the National Register of Historic Places, SCS is required to afford the Council an opportunity to comment in accordance with the "Procedures for the Protection of Historic and Cultural Properties" (36 C.F.R. Part 800). For your information, steps to determine eligibility are set forth in Section 800.4(a)(2) of the Procedures, a copy of which is enclosed for your convenience.

Should you have any questions or require additional assistance, please contact Michael H. Bureman of the Advisory Council staff at P.O. Box 25085, Denver, Colorado 80225, telephone number (303) 234-4946.

Sincerely yours,

John D. McDermott
Director, Office of Review
and Compliance

Enclosure

STATE OF LOUISIANA
DEPARTMENT OF HIGHWAYS
P. O. BOX 44245, CAPITOL STATION
BATON ROUGE, LA. 70804

IN REPLY PLEASE REFER TO
FILE NO.

February 4, 1975

Mr. Alton Mangum
State Conservationist
United States Department of Agriculture
Soil Conservation Service
P. O. Box 1630
Alexandria, Louisiana 71301

Dear Mr. Mangum:

We have reviewed a copy of the Draft Environmental Impact Statement on the East Franklin Watershed, Louisiana, No. USDA - SCS - EIS - WS - (ADM) - 75 - 3 - (D) - LA and have no comment.

Thank you for giving the Department of Highways the opportunity to review the proposed project.

Sincerely,

GEORGE A. LANDRY
PUBLIC HEARINGS &
ENVIRONMENTAL ENGINEER

GAL/JTL/nle

cc: Mr. W. T. Taylor, Jr.
Mr. S. L. Poleynard
Mr. D. D. White
Mr. J. E. Boagni
Mr. J. R. Reid

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
REGIONAL OFFICE
1114 COMMERCE STREET
DALLAS, TEXAS 75202

OFFICE OF
THE REGIONAL DIRECTOR

Our Reference: EI# 1274-460
1274-465

January 13, 1975

Mr. Alton Mangum
State Conservationist
United States Department of Agriculture
Soil Conservation Service
P.O. Box 1630
Alexandria, Louisiana 71301

RE: East Franklin Watershed, Louisiana

Pursuant to your request, we have reviewed the Environmental Impact Statement for the above project proposal in accordance with Section 102(2) (c) of P. L. 91-190, and the Council on Environmental Quality Guidelines of April 23, 1971.

Environmental health program responsibilities and standards of the Department of Health, Education, and Welfare include those vested with the United States Public Health Service and the Facilities Engineering and Construction Agency. The U.S. Public Health Service has those programs of the Federal Food and Drug Administration, which include the National Institute of Occupational Safety and Health and the Bureau of Community Environmental Management (housing, injury control, recreational health and insect and rodent control).

Accordingly, our review of the Draft Environmental Statement for the project discerns no adverse effects that might be of significance where our program responsibilities and standards pertain, provided that appropriate guides are followed in concert with State, County, and local environmental laws and regulations.

We therefore have no objection to the authorization of this project insofar as our interests and responsibilities are concerned.

Very truly yours,

Wm F. Crawford

William F. Crawford
Environmental Impact Coordinator

STATE OF LOUISIANA

Department of Art, Historical and Cultural Preservation

OLD STATE CAPITOL, BATON ROUGE, LOUISIANA 70801
(504) 389-5086

EDWIN EDWARDS
GOVERNOR

JAY R. BROUSSARD
DIRECTOR

January 9, 1975

Mr. Alton Mangum
State Conservationist
Soil Conservation Service
P. O. Box 1630
Alexandria, Louisiana 71301

USDA-SCS-EIS-WS-(ADM)-75-2-(D)-LA
East Franklin Watershed
Catahoula, Franklin and Richland Parishes

Dear Mr. Mangum:

This Department does not know of any sites on the National Register of Historic Places or being actively nominated to the National Register which would be effected by the proposed project.

Thank you for the opportunity for comment on the proposed project.

Sincerely,

Jay R. Broussard

Jay R. Broussard
State Historic Preservation Officer
Director, Department of Art, Historical and Cultural Preservation

JB/bc

cc Mr. DeWitt H. Braud, Jr.
Commission on Intergovernmental Relations

OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA FPMR (41 CFR) 101-11.6

UNITED STATES GOVERNMENT

# *Memorandum*

TO : George H. Davis, WRD
Attention: G. H. Chase
Reston, Virginia Mail Stop 407

DATE: January 16, 1975

FROM : District Chief, WRD
Baton Rouge, Louisiana

SUBJECT: Review of draft environmental statement and work plan for East Franklin Watershed, Catahoula/Franklin/Richland Parishes, Louisiana (ER-74/1517)

We have reviewed the subject statement and find it to be reasonably adequate and accurate in its evaluation of the impact of the proposed action on the hydrologic environment.

FOR THE DISTRICT CHIEF

Max J. Forbes, Jr.
Hydrologist

cc:
Regional Hydrologist, CR, WRD
Lakewood, Colorado
District reading file

MJForbes:as 1-16-75

State of Louisiana

LEO W. HOUGH
STATE GEOLOGIST

LOUISIANA GEOLOGICAL SURVEY
BATON ROUGE 70803

P. O. BOX G
UNIVERSITY STATION

December 16, 1974

Mr. Alton Mangum, State Conservationist
U. S. Department of Agriculture
Soil Conservation Service
P. O. Box 1630
Alexandria, Louisiana 71301

Dear Mr. Mangum:

We have received the copy of the draft environmental statement on East Franklin Watershed, Louisiana and thank you very much for sending it to us.

Yours very truly,

LOUISIANA GEOLOGICAL SURVEY

Leo W. Hough

Leo W. Hough
State Geologist

LWH:FMM

# State of Louisiana

EXECUTIVE DEPARTMENT

**Baton Rouge**

**Governor's Council on Environmental Quality**

February 7, 1975

EDWIN EDWARDS
GOVERNOR

CLINT PRAY
CHAIRMAN AND
ECUTIVE DIRECTOR

OUNCIL MEMBERS:

RICHARD W. BRYAN
RCY L. LORMAND, SR.

LLIAM J. MOLLERE
SSISTANT DIRECTOR

ILLIAM B. DeVILLE
ECTOR OF RESEARCH

U. S. Department of Agriculture
Soil Conservation Service
P. O. Box 1630
Alexandria, La. 71301

Subject: Comment on East Franklin Watershed Environmental Impact Statement, Project USDA-SCS-EIS-WS-(ADM)-75-2-(d)-LA

Dear Sirs:

The Governor's Council on Environmental Quality (GCEQ) has completed a study of the above referenced Environmental Impact Statement.

Soil Conservation Service is to be commended on the detailed documentation supplied. The candid appraisal of adverse environmental impacts, together with discussions of measures to be taken to minimize adverse impacts, allows the review process to be done more thoroughly. It is hoped that future environmental impact statements prepared by the Soil Conservation Service will meet a similar professional standard.

This letter is intended to serve as a negative declaration on the project.

Sincerely,

Clint Pray

Clint Pray
Exec.Assistant to the Governor

CP:dls

3101 37th STREET
SUITE 201
ETARIE, LA. 70001
(504) 527-5891

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

MAILING ADDRESS:
U.S. COAST GUARD (G-WS/73)
400 SEVENTH STREET SW.
WASHINGTON, D.C. 20590
PHONE: (202) 426-2262

10 FEB 1975

Mr. Alton Mangum
State Conservationist
Soil Conservation Service
P. O. Box 1630
Alexandria, Louisiana 71301

Dear Mr. Mangum:

This is in response to your letter of 13 December 1974 addressed to Commandant, U. S. Coast Guard concerning a draft environmental statement for the East Franklin Watershed Project Catahoula, Franklin, and Richland Parishes, Louisiana.

The Department of Transportation has reviewed the material submitted. We have no comments to offer nor do we have any objection to this project.

The opportunity to review this draft statement is appreciated.

Sincerely,

W. E. Caldwell

W. E. CALDWELL
Captain, U.S. Coast Guard
Deputy Chief, Office of Marine
Environment and Systems
By direction of the Commandant

State of Louisiana

WILD LIFE AND FISHERIES COMMISSION
400 ROYAL STREET
NEW ORLEANS 70130

J. BURTON ANGELLE
DIRECTOR

February 6, 1975

Mr. Alton Mangum, State Conservationist
United States Department of Agriculture
Soil Conservation Service
Alexandria, Louisiana 71301

Dear Mr. Mangum:

Personnel of this Agency have reviewed the Draft Environmental Impact Statement you have prepared for the East Franklin Watershed Project.

We are especially grateful that you have recognized the role of water quality in maintenance of the fresh water fishery found in Bayou Macon cutoff number three.

We are aware that the Soil Conservation Service and the sponsors have succeeded in reducing damages to fish and wildlife habitat considerably below that anticipated from the original watershed plan.

The Louisiana Wildlife and Fisheries Commission appreciates the opportunities for reviewing this project during the planning states and for commenting on this draft.

Sincerely,

J. Burton Angelle

J. Burton Angelle

JBA:tam

DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
WASHINGTON, D.C. 20310

21 MA

Honorable Robert W. Long
Assistant Secretary of Agriculture
Washington, D. C. 20250

Dear Mr. Long:

In compliance with the provisions of Section 5 of Public Law 566, 83d Congress, the views of the Secretary of the Army were requested for the Watershed Work Plan and Draft Environmental Statement for East Franklin Watershed, Catahoula, Franklin, and Richland Parishes, Louisiana.

The outlets for the proposed projects are three streams which have Corps of Engineers projects. Analysis of the channel design of Boeuf River and Tensas River, below the point where the work plan channels enter, indicates that these channels are adequate to carry the design flow of the proposed works. The channel design of Bayou Macon is inadequate to carry the design flow proposed. The Lake Chicot pumping plant, authorized for construction by the Corps of Engineers in the headwater of Bayou Macon, will reduce stages in Bayou Macon to more than compensate for the increase in flows following construction of the watershed plan. Therefore, we believe that construction of that part of the watershed plan which discharges into Bayou Macon should be deferred until the Lake Chicot pumping plant is put into operation. Construction will take about three years to complete depending on adequate funding.

Comments on the Draft Environmental Impact Statement are inclosed.

Sincerely,

Charles R. Ford

Charles R. Ford
Deputy Assistant Secretary of the Army
(Civil Works)

1 Incl (dupl)
As stated

EAST FRANKLIN WATERSHED, LOUISIANA

COMMENTS ON DRAFT EIS

1. Page 11, 6th subpara. From an environmental standpoint, it may be more desirable not to smooth spoil in forested areas since this may encourage landowners to plant or graze such areas.

2. Page 13, last para. Location of weirs and permanent water to be created should be shown on a map.

3. Page 15, Land Use Changes. From the table presented, it appears that no additional forest lands will be cleared other than that for right-of way. This should be verified as most projects of this type result in some induced clearing.

4. Page 34, Plant and Animal Resources. Inclusion of data on fishes, benthic invertebrates, and water quality in the streams proposed for alteration would be helpful in assessing impacts on aquatic ecosystems.

5. Page 34, 3d para. The source of data on fish standing crop estimates (for Bayou Macon, Tensas River, and Boeuf River) should be cited. This comment also applies to estimates for lakes, multiple use ponds, and catfish ponds referred to in the proceeding para. Descriptions of species diversity should reference or provide data on relative numbers of individuals of each species rather than generalizations on total numbers of species present.

6. Page 34, last line. The statement, that the dissolved solids concentrations listed in the table on page 37 are limiting fish production, should be considered. Jenkins (Jenkins, Robert M., 1973, Reservoir Management Prognosis: Migraines or Miracles. Paper presented at Southern Division, American Fisheries Society, Hot Springs, Arkansas, October 15, 1973) has shown that sport fish standing crops are highest in moderately hard waters (i.e. those waters having a range in total dissolved solids concentration of 100-350 ppm). Based on his findings, the dissolved solids concentrations reported for Bayou Macon and the Tensas River are optimal for sport fish production. References should be cited to support the conclusion that such concentrations (for any of the parameters listed) are limiting productivity.

7. Page 37, last para. Data on which standing crop estimates and species composition descriptions are based should be included or cited.

8. Page 39, 1st para. It would be helpful if location of existing forest lands was shown on a map containing the proposed project features.

9. Page 71, line 4. The location of the 10,000-acre bottomland forest tract should be included on a project area map.

10. Page 72, top para. As a general rule, improved farming practices do not improve wildlife habitat.

11. Pages 72-75, Erosion and Sediment. The utility of the proposed weirs to fish and wildlife is questioned. These structures are apparently intended to trap sediment rather than provide permanent aquatic habitat. These "pools" will trap 48,240 tons of sediment (page 74) or 84% of the sediment delivered annually be the proposed project channels. Since the pools will average only 1.5 feet deep, it is reasonable to anticipate a complete loss of useful aquatic habitat within a very short period of time. Thereafter, all additional annual sediment will be transported downstream.

12. Page 78, 2d subpara. The statement that there will be complete recovery of the aquatic biological community one year after construction, is not consistent with published information.

13. Page 79. The proposed project will permit intensification of farming and will result in increased concentrations of pesticides in its runoff. This will adversely affect the Bayou Macon cutoffs as well as downstream aquatic habitats. This impact of project implementation and its significance should be discussed.

14. Page 79, 3d subpara and other paras. If the present world price of soybeans holds up, timber clearing could be resumed.

15. Page 89, Alternatives. The relative impacts of the various alternatives would be clarified by the inclusion of a summary-type table which would present changes in habitat types, benefits, costs, etc. expected to result from implementation of each alternative considered.

16. Page 90, "Change land use . . .", 3d and 4th subparas. If cottonwoods are planted, returns will be much higher and rotations much shorter.

March 1975

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

APR 1

In Reply Refer to:
ER-74/1517

Dear Mr. Mangum:

Thank you for your letter of December 13, 1974, requesting our views and comments on the draft environmental statement and work plan for East Franklin Watershed, Catahoula, Franklin, Richland Parishes, Louisiana. We offer the following comments.

Work Plan

The proposed action will not adversely affect any existing or proposed unit of the National Park System nor any historical, natural or environmental education site eligible for registration to the National Landmark Programs.

An examination of library and file data, without the benefit of a field investigation, revealed that during 1972 the value of mineral production from the aforementioned parishes was as follows:

| Parish | Value Thousands | Commodities Produced |
|---|---|---|
| Catahoula | $10,943 | Petroleum, sand and gravel, natural gas, stone |
| Franklin | 2,219 | Petroleum, natural gas |
| Richland | 24,597 | Petroleum, natural gas liquids, natural gas |

Known mineral resources within the watershed are limited to oil, gas, sand and gravel, and stone. Both documents acknowledge the existence of mineral resources (work plan, p. 9 and environmental statement, p. 25) and state that "oil, gas, and gravel are produced within the watershed. No commercial clay deposits occur." Neither document describes the effects of such a project on the future development of mineral resources

in the area. In addition, neither document discusses the existence of pipelines that traverse the area nor any plans to protect or relocate them.

We suggest that the final drafts of both documents discuss the effects of the project on mineral resources and any plans for subordinating, purchasing, protecting, or relocating the pipelines.

## Draft Environmental Statement

### General Comments

The draft environmental impact statement does not adequately address the adverse impacts that can be expected to occur on the fish and wildlife resources within the project area. Approximately 196,000 acres of land will be affected by the proposed project. Of this total, there are approximately 36,900 acres of undeveloped land that provide valuable habitat for many species of wildlife. This project, with its associated land conversions from forestland to intensified agricultural uses, will result in a decrease in the amount of wildlife habitat available with a resultant decrease in wildlife populations.

Our review of the watershed work plan reveals that it is almost identical in content to the draft environmental statement. For that reason, any detailed comments would be reiterative since the work plan is deficient for the same reasons discussed in comments on the draft environmental impact statement. Included in this letter is the official report of the Fish and Wildlife Service, prepared and submitted in accordance with the authority contained in Section 12 of the Watershed Protection and Flood Prevention Act (68 Stat. 666, as amended; 16 U.S.C. 1008). Previous comments were submitted in our February 17, 1970 report on this watershed.

### Planned Project

It is stated on page 1, paragraph 2, that an increase in wildlife carrying capacity will result on existing forest lands from forest management practices. However, in the same section it is stated that there will be a decrease in forest game habitat. Further explanation is needed to clarify these conflicting statements.

Although land conversion may not be encouraged, page 7, paragraph 3, in many instances this is a significant factor in the destruction of valuable woodland wildlife habitat which is becoming scarce within the project area.

With regard to installation of land treatment measures, the data provided does not show that these measures will actually be installed, page 7, paragraph 4. Although measures may be established because of the financial inducement provided, further explanation is needed to show how these practices will be maintained.

Habitat enhancement discussed on page 8, paragraph 4, of the statement does not give needed detailed information to properly evaluate these wildlife land treatment measures. Moreover, these measures are usually not a product of completed watershed projects. Therefore, more supportive information is needed as to what will be maintained, created, and improved.

Paragraph 1 on page 12 states that the lower end of certain channels will not be excavated in order that they may act as filters for runoff before entering major streams. Further explanation is needed as to what will be filtered, how effective filtering will be and how these unexcavated channels will reduce adverse downstream effects.

Paragraph 2 on page 12 implies that certain channels will not be excavated due to their adequacy. However, it should be stated that these same channels will be maintained to insure present flow conditions. Also, it should be stated how they will be maintained and what associated adverse effects this will have on the fish and wildlife resources.

Paragraph 3 on page 12 should include a description of all the acres that are to be disturbed and their relative value to the associated wildlife resources. This should include the 823 acres that are now occupied by channels, berms and spoil.

The summarized data presented on page 14 is questionable and should be documented as to source so it can be reviewed for accuracy.

The fact that three of the seven miles of ponded water are to be altered is not reflected in the tabulated data, page 14, which shows that acres and standing crop will remain the same after project construction. This contradicts later statements

to the effect that biological productivity will be lowered on three miles of ponded water. Also included in this data should be species composition figures.

The seven tested measures listed on page 15 may minimize the adverse effects of the project, but will not in any manner eliminate adverse effects.

Environmental Setting

This section states that there will be only two channels entering into project lakes. These channels exit into Bayou Macon cutoff Numbers 2 and 3. Due to the fact that 30 percent of the noncommercial fisheries are within these two cutoffs, we believe that the use of the word "only" is inappropriate, page 28, paragraph 2.

The description represented in the tabulated data, pages 31-34, is inconsistent with Type 1 wetland[1/] which should be stated as seasonally flooded basins and flats. Therefore, the 3,265-acre figure should be expanded to include areas other than "seasonally flooded hardwoods."

Liters per milligram should be stated as milligrams per liter, tabulated data, page 37. Explanation of the data should explain why the concentrations of dissolved solids are limiting fish production.

Environmental Impacts

This section states that one channel (M-16) crosses a large forested tract, page 71. We also note that channel M-14 crosses the same large forested tract but is not mentioned in the statement, an explanation is desired.

The statement that no significant land use changes will occur does not explain the possible adverse effects that land use changes in the vicinity of channels M-7 and M-10 could have on the associated valuable wildlife wetland and forestland and habitats, page 79, paragraph 4.

The last paragraph on page 79 should explain why there will be no adverse effects on the fisheries. Sedimentation and pesticide runoffs will increase, due to the fact that post-project conditions

1/ U.S. Department of the Interior, Fish and Wildlife Service, Wetlands of the United States, Circular 39, Issued 1956. Reissued 1971.

will be conducive to intensified agricultural use. This situation could further degrade the present aquatic resources.

Paragraph 3, page 81 states that a monitoring program has been developed for preproject and postproject water quality conditions. Preproject water quality conditions should be included.

It is questionable that mourning dove and bobwhite quail will benefit from land conversion to open land when forested areas to be cleared provide nesting and escape cover, page 82, paragraph 2. With intensive agricultural use of land as a result of project benefits, it is doubtful that any land will revert to brush-type habitat.

An explanation is needed to clarify whether the weir designed for channel M-20, page 83, paragraph2, will create ponded water, or if the weir is for the protection of the previously existing 23 acres of Type 5, wetlands[2]. If no ponded water is created by this weir, then 27 weirs should be credited with water impounded and not 28 as stated earlier. Acreage adjustments are also needed if the weir in M-20 is credited for ponding previously existing water.

Fish and Wildlife Service Report

The East Franklin Watershed is located in Catahoula, Franklin, and Richland Parishes, Louisiana. The watershed is approximately 196,000 acres in size. Of this acreage, 117,300 acres are cropland, 28,440 acres are in pasture, 36,900 acres are forest land, and 13,800 acres are other lands. Project plans call for the disturbance of 1,863 acres of land for channel rights-of-way. Channel excavation proposed for the project totals 222 miles, including 193 miles of ephemeral streams, 22 miles of intermittent streams, and 7 miles of ponded water. Twenty-eight water control weirs will be constructed to impound 146 acres of waters on excavated channels.

The fishery resources of the project area include 22 miles of low quality intermittent stream habitat types. Of more importance is 1,706 acres of lakes, ponds, and cutoffs, of which 790 acres of this total are in commercial catfish production. Fish species found in the project are largemouth bass, black and white crappies, chain pickerel, bluegill, redear sunfish, and other sunfishes, carp, buffalo, gar, shad, and catfishes.

2/ Ibid.

Bayou Macon cutoff Numbers 1, 2, and 3 comprise approximately 30 percent of the non-commercial fishery resources of the project area. Bayou Macon cutoff No. 1 has a high quality balanced fishery which supports a standing crop of approximately 195 pounds per acre.

Forest game within the project area are afforded valuable habitat by approximately 36,000 acres of high quality bottom-land hardwoods. These species include high populations of white-tailed deer, wild turkey, gray squirrel, fox squirrel, and swamp rabbits. Many other game and non-game species are found within these bottom-land hardwoods, such as mink, beaver, raccoon, bobcat, gray fox, mallard, blue-winged teal, pintail, and gadwall.

Low populations of upland species such as the cottontail rabbit, bobwhite quail, and mourning dove are limited by food, escape cover, and nesting cover.

Project construction will result in the destruction of approximately 700 acres of wooded stream channel banks and forest, and a conversion of 22 miles of intermittent streams into 146 acres of ponded water. Post-project conditions will also be conducive to intensified agricultural practices which will result in the possible destruction by drainage of many more acres of valuable wildlife habitat.

Although stated in the work plan for this watershed project, the 2,400 acres of multiple-use wildlife habitat planned will have little or no beneficial effect on wildlife resources. This is usually the case and can be documented in many other watershed projects that wildlife land treatment measures are planned but are seldom, if ever, implemented.

Therefore, due to the adverse effects on wildlife resources that are likely to occur within this watershed project area, we recommend the following:

1. That 2,400 acres of land treatment measures be planned in detail in agreement with the Louisiana Wild Life and Fish Commission and project sponsors;

2. That there be some legal binding agreement between the sponsors, construction agency, and the Louisiana Wild Life and Fish Commission to insure the installation of planned land treatment measures for wildlife; and,

3. That every effort be made to insure that the remaining 36,900 acres of forest land not be converted to intensive agricultural use.

Sincerely yours,

Stanley D Doremus

Deputy Assi[illegible] Secretary of the Interior

Mr. Alton Mangum
State Conservationist
Soil Conservation Service
P.O. Box 1630
Alexandria, Louisiana 71301